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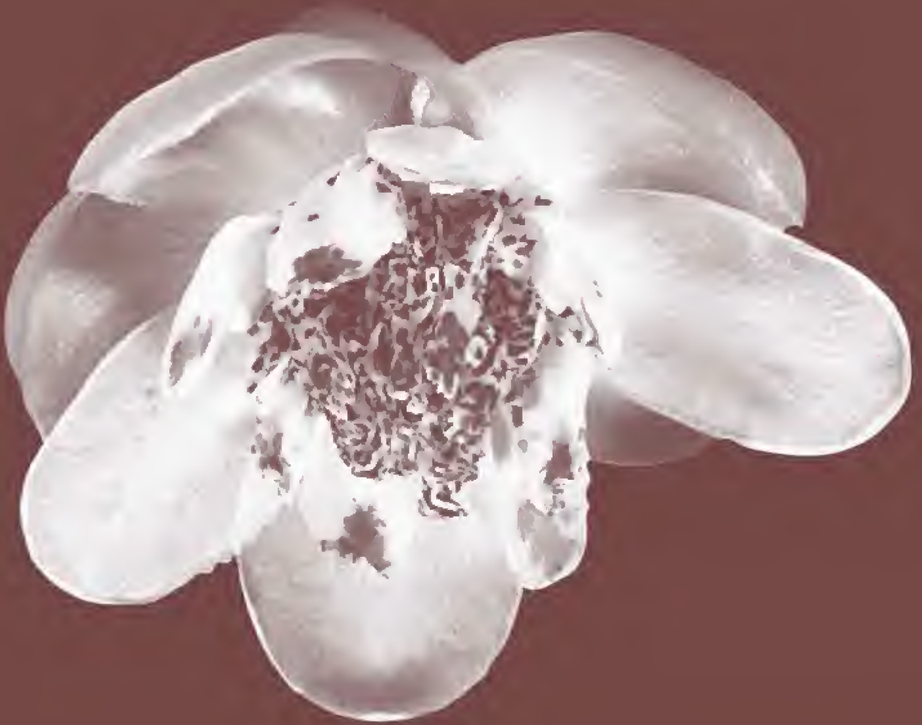

Queensland Herbarium

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Volume 6 Number 4 2004

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Notes on Tiliaceae in Australia, 4. A revision of the stellate-haired species of the genus *Corchorus* L.

D. A. Halford

Summary

Halford, D.A. (2004). Notes on Tiliaceae in Australia, 4. A revision of the stellate-haired species of the genus *Corchorus* L. *Austrobaileya* 6 (4): 581–629. Twenty-two species are recognised and a key is provided for their identification. The following species are newly described: *C. aulacocarpus* Halford, *C. carnarvonensis* Halford, *C. congener* Halford, *C. incanus* Halford, *C. lasiocarpus* Halford, *C. mitchellensis* Halford, *C. obclavatus* Halford, *C. puberulus* Halford, *C. subargentus* Halford, *C. sublatus* Halford and *C. tectus* Halford. Three new combinations *C. sericeus* subsp. *densiflorus* (Benth.) Halford, based on *C. walcottii* var. *densiflorus* Benth.; *C. sidoides* subsp. *rostrisepalus* (Domin) Halford, based on *C. rostrisepalus* Domin; *C. sidoides* subsp. *vermicularis* (F.Muell.) Halford, based on *C. vermicularis* F.Muell., are made. Two new subspecies are described: *C. incanus* subsp. *lithophilus* Halford and *C. lasiocarpus* subsp. *parvus* Halford. All new taxa are illustrated, while all taxa are described and mapped, and notes on their distribution, habitat and phenology are given. Lectotypes are chosen for *Nettoa crozophorifolia* Baill., *C. elderi* F.Muell., *C. pumilio* R.Br. ex Benth., *C. rostrisepalus* Domin, *C. sidoides* F.Muell., *C. tomentellus* F.Muell., *C. walcottii* F.Muell. and *C. walcottii* var. *densiflorus* Benth. All known synonyms are listed here including manuscript names that were used to identify taxa prior to their formal naming in this publication.

Key words: Tiliaceae, *Corchorus*, Australian flora, taxonomy, nomenclature

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Introduction

This is the fourth paper in a series examining the family Tiliaceae in Australia and the second concerned with the genus *Corchorus* L. This paper examines the stellate-haired species of *Corchorus*. The taxonomy of the other Australian species (simple-haired species) were dealt with in Halford (1995). A brief history of the taxonomy of the Australian representatives of this genus was also presented in that paper. All species treated here are endemic to Australia. Taxonomic problems certainly remain in the stellate-haired species of *Corchorus* in Australia and there is need for further collection and study throughout the range of the group, especially in the Pilbara and Kimberley regions of Western Australia and Arnhem Land, Northern Territory. Such field investigations are beyond the resources of the present author. A total of 35 species (13 simple-haired and 22 stellate-haired) are recognised as occurring in Australia.

Materials and methods

This revision is based on an assessment of morphological characters of approximately 700 dried herbarium collections and collections and field studies undertaken by the author in 1992 and 1993. Collections from the following herbaria were studied: AD, BRI, CANB, DNA, K, MEL, NSW, P and PERTH. These herbarium acronyms follow Holmgren *et al.* (1990). All specimens cited have been seen unless otherwise indicated (as *n.v.*).

The species treated in the present paper are listed alphabetically. Descriptions of colour of vegetative and flora parts are either from the herbarium labels or from photographs taken by the author during field studies. Measurements listed are based upon the total variation observed in the herbarium specimens examined. Plant size, flowering and fruiting times, and habitat information were obtained from herbarium labels. All measurements were made from dried material, material preserved in 70% ethanol or dried material reconstituted by placing in boiling water for a few minutes. The distribution maps are based on herbarium specimen locality data.

Accepted for publication 7 March 2004

Taxonomy

Key to stellate-haired *Corchorus* in Australia

1. Sepals persistent in fruit 2
Sepals not persistent in fruit 9

2. Glandular hairs yellow or red-brown, conspicuous, on either stems, petioles, peduncles, pedicels or abaxial surface of sepals 3
Glandular hairs white and inconspicuous or absent 4

3. Sepals < 9 mm long (W.A.) .... **13. C. parviflorus**
Sepals > 9 mm long (W.A.) .... **8. C. laniflorus**

4. Annulus densely stellate-pubescent (W.A.) .... **4. C. crozophorifolius**
Annulus glabrous or with a few scattered hairs 5

5. Fruits < 5 mm long, with indumentum of stellate hairs; ovary 3 or 4-locular; ovules < 10 in each locule 6
Fruits > 5 mm long, with indumentum of stellate and dendritic-stellate hairs; ovary 3 to 5-locular; ovules 10–25 in each locule 7

6. Leaf laminae narrowly to broadly ovate or ovate-elliptic (N.T., Qld) ...... **16. C. sericeus**
Leaf laminae narrowly oblong to oblong (W.A.) .... **20. C. tectus**

7. Fruits ≥ 12 mm across (including indumentum) (W.A.) .... **9. C. lasiocarpus**
Fruits < 12 mm across (including indumentum) 8

8. Leaf laminae narrowly oblong to oblong or narrowly ovate, 0.4–2.5 cm wide, l:w ratio ≥ 2:1 (W.A.) .... **9. C. lasiocarpus**
Leaf laminae ovate to very broadly ovate, 2–7 cm wide, l:w ratio < 2:1 (W.A.) .... **7. C. incanus**

9. Fruits with indumentum of stellate and dendritic-stellate hairs 10
Fruits with indumentum of stellate hairs only 13

10. Glandular hairs present on stems, petioles, peduncles, pedicels or abaxial surface of sepals (W.A.) .... **22. C. walcottii**
Glandular hairs absent 11

11. Fruits subcylindrical, 10–18 mm long, 1.5–2.5 m across (including indumentum), 5–12 times longer than wide (W.A.) .... **3. C. congener**
Fruits narrowly to broadly ellipsoid or narrowly ovoid, 4–10 mm long, 1–8 mm across (including indumentum), < 5 times longer than wide 12

12. Fruits ellipsoid to broadly ellipsoid, 4–8 mm across (including indumentum), 4 or 5-valved; inflorescences 2 or 3-flowered; pedicels 2–7 mm long; adaxial surface of leaf laminae glabrous or with a sparse indumentum (epidermis clearly visible) (N.T., Qld) .... **6. C. elderi**
Fruits narrowly ellipsoid or narrowly ovoid, 1–4 mm across (including indumentum), 3(rarely 4)-valved; inflorescences 3–7-flowered; pedicels 1–2 mm long; adaxial surface of leaf laminae with a moderately dense to dense indumentum (epidermis not visible) (W.A.) .... **5. C. elachocarpus**

13. Fruits obtusely angled in transverse section, usually < 10 times as long as wide, not constricted between the seeds 14
    Fruits circular in transverse section, mostly 10 or more times as long as wide, slightly or markedly constricted between the seeds 15

14. Leaf laminae ovate, 2–5 cm wide, l:w ratio ≤ 3:1, margin serrate to serrulate; sepals 9–15 mm long; petals 9–10 mm long, 4–7 mm wide (W.A.) ... **14. C. puberulus**
    Leaf laminae narrowly ovate, 0.8–2.5 cm wide, l:w ratio 3–7:1, margin serrulate; sepals 6–9 mm long; petals 6–7 mm long, 2–4 mm wide (N.T.) .... **1. C. aulacocarpus**

15. Fruits < 15 mm long 16
    Fruits ≥ 15 mm long 18

16. Shrubs to 2 m high; branchlets erect; leaf laminae narrowly ovate, 3–9 cm long; fruits obclavate (N.T.) .... **12. C. obclavatus**
    Shrubs mostly to 1 m high; branchlets spreading or if erect then leaf laminae oblong or oblong-elliptic, 0.6–3.5 cm long or if ovate and ≥ 3.5 cm long then fruits cylindrical 17

17. Indumentum on young shoots and buds ferruginous or if greyish white then either abaxial surface of sepals obscured by dense indumentum or leaf laminae narrowly ovate to ovate and > 1.5 cm wide; stamens > 20 (W.A., N.T., Qld) .... **17. C. sidoides**
    Indumentum on young shoots and buds greyish white, or if ferruginous then abaxial surface of sepals not completely obscured by indumentum; leaf laminae oblong, oblong-elliptic or narrowly elliptic and ≤ 1.5 cm wide; stamens mostly < 20 (W.A., N.T., Qld) .... **15. C. pumilio**

18. Sepals ≥ 12 mm long (W.A.) .... **10. C. leptocarpus**
    Sepals < 12 mm long 19

19. Apex of mature fruits erect or ascending 20
    Apex of mature fruits orientated downward 22

20. Stellate hairs up to 1.5 mm across; leaves soft to the touch; fruits 3–4 mm across (including indumentum) (W.A.) .... **11. C. mitchellensis**
    Stellate hairs up to 0.5 mm across; leaves felt-like to the touch; fruits 1–2.5 mm across (including indumentum) 21

21. Peduncles 2–5 mm long (N.T.) .... **19. C. sublatus**
    Peduncles 7–15 mm long (Qld) .... **18. C. subargentus**

22. Sepals 9–11 mm long, 2–3 mm wide; flower buds 3–6 mm across; indumentum on young shoots ferruginous; fruits 2–3 mm across, not conspicuously constricted between seeds; stamens > 80 (W.A.) ... **2. C. carnarvonensis**
    Sepals < 9 mm long, 1–2 mm wide; flower buds 1–3 mm across; indumentum on young shoots white or if ferruginous then fruits < 2 mm across and slightly to markedly constricted between seeds; stamens < 70 23

23. Leaf laminae ovate, 1.3–2 times as long as wide; indumentum moderately dense on adaxial surface of leaf (epidermis clearly visible); fruits 0.7–1.5 mm across (including indumentum) (Qld) .... **21. C. tomentellus**
    Leaf laminae oblong, oblong-elliptic, ovate-elliptic or if ovate then more than 2.5 times as long as wide and with a dense indumentum (epidermis not visible); fruits 1–2.5 mm across (including indumentum) (W.A., N.T., Qld) .... **17. C. sidoides**

1. Corchorus aulacocarpus Halford **sp. nov.** similis *C. leptocarpo* autem fructibus latioribus (3–4 mm latis comparitis 2–3 mm latis) minus quam 10 plo longioribus quam latis, in sectione transversali trigonis vel tetragonis non circularibus, inter semina non constrictis differt. *Corchorus aulacocarpus* floribus ex sepalis 6–9 × 1–2 mm, petalis 6–7 × 2–4 mm, filamentis staminalibus 3–4 mm longis, stylo 2–4 mm longo compositis, pedunculis 2–3 mm longis, foliis 0.8–2.5 cm latis praeditus ut videtur maxime arcte affinis *C. puberulo* qui flores majores ex sepalis 9–15 × 2–3 mm, petalis 9–10 × 4–7 mm, filamentis staminalibus 4–6 mm longis, stylo 4–6 mm longo compositos, pedunculos longiores 2–4 mm longos, folia interdum latiores 2–5 lata habet. **Typus:** Northern Territory. DARWIN AND GULF REGION: Mt Basedow Range, 1 June 1973, *T.G. Hartley* 13886 (holo: DNA; iso: CANB).

Shrub to 2 m high; stems sparingly branched, erect; young shoots with ferruginous indumentum. Indumentum on branchlets, leaves, stipules, peduncles, pedicels and bracts greyish-white, dense, comprised of stellate hairs. Stellate hairs sessile or stipitate, up to 0.2 mm across; stipes red-brown, straight, up to 0.2 mm long; rays pliable, white or ferruginous, up to 0.1 mm long. Leaves with petioles 5–12 mm long; stipules linear, 3–5 mm long; lamina narrowly ovate, 4–10 cm long, 0.8–2.5 cm wide, l:w ratio 3–7:1, discolorous; base rounded or rarely cordate; margin serrulate; apex acute or rarely obtuse. Inflorescences umbellate, 5–9-flowered, leaf-opposed or lateral, solitary at upper nodes; peduncles 2–3 mm long; pedicels 2–4 mm long; bracts filiform-linear, 3–4 mm long. Flower buds obovoid-ellipsoid, 4–5 mm across, longitudinally ridged; apex obtuse with 5 spreading caudae to 1 mm long. Sepals 5, not persistent, narrowly obovate, 6–9 mm long, 1–2 mm wide; abaxial surface with a moderately dense to dense indumentum of stellate hairs up to 0.5 mm long; adaxial surface glabrous or sometimes sparsely stellate-pubescent proximally; apex acuminate-caudate, up to 1 mm long. Petals 5; lamina narrowly obovate to obovate, 6–7 mm long, 2–4 mm wide, glabrous; claw c. 1 mm long, stellate-pubescent on margins. Androgynophore 0.2–0.3 mm long; annulus sinuate or entire, 0.2–0.3 mm long, glabrous. Stamens 45–60; filaments 3–4 mm long; anthers c. 0.5 mm long. Ovary subcylindrical, 0.7–1 mm across, densely stellate-puberulous, 3(rarely 4)-locular, with 26–32 ovules in each locule; style 2–4 mm long. Fruits on recurved pedicels, subcylindrical, 8–18 mm long, 3–4 mm across, 2–6 times longer than wide, curved or straight, 3 or 4-sided, obtusely-angled in transverse section, longitudinal sulcate, not constricted between seeds, 3(rarely 4)-valved; apex obtuse or rounded, orientated upward; indumentum moderately dense to dense, of stellate hairs up to 0.3 mm long. Seeds compressed obovoid or columnar, 1–2 mm long. **Fig. 1.**

***Additional specimens*: Northern Territory.** DARWIN AND GULF REGION: c. 12 miles [c. 19 km] S [of] Mt Brockman, Jul 1972, *Byrnes* 2713 (CANB, DNA); Mt Basedow, 20 km SE of Cooinda, Jun 1980, *Craven* 6310 (CANB, DNA); Kakadu NP, Upper Koolpin Creek, Jun 1988, *Russell-Smith* 5509 & *Lucas* (BRI, DNA); 1/4 mile [c. 0.4 km] SW [of] El Sharana, Jan 1973, *Martensz* & *Schodde* AE451 (BRI, CANB); 4 miles [c. 6 km] NW [of] El Sharana, Pine Creek road, Jan 1973, *Martensz* & *Schodde* AE503 (BRI, CANB); 2 km SE of El Sharana Mine, Apr 1992, *Halford* Q1172 (BRI); 10 miles [c. 16 km] ESE [of] Noranda Mining Camp, Jun 1972, *Schodde* AE60 (CANB, DNA).

***Distribution and habitat*:** *Corchorus aulacocarpus* is confined to Arnhem Land, Northern Territory from Mt Brockman southwards to El Sharana (**Map 4**). It is recorded as growing in woodland communities with spinifex groundcover on shallow sandy soils, and in *Allosyncarpia* forest on talus slopes and on broken sandstone ridges.

***Phenology*:** Flowers have been recorded from January and June, fruits from January, April, June and July.

***Affinities*:** *Corchorus aulacocarpus* is similar to *C. leptocarpus* but differs from that by having broader fruits (3–4 mm across compared with 2–3 mm across) which are < 10 times as long as wide, trigonous or tetragonous rather than circular in transverse section and are not constricted between the seeds. *Corchorus aulacocarpus* seems most closely related to *C. puberulus* but differs from that by having smaller flowers (sepals 6–9 × 1–2 mm, petals 6–7 × 2–4 mm, staminal filaments 3–4 mm

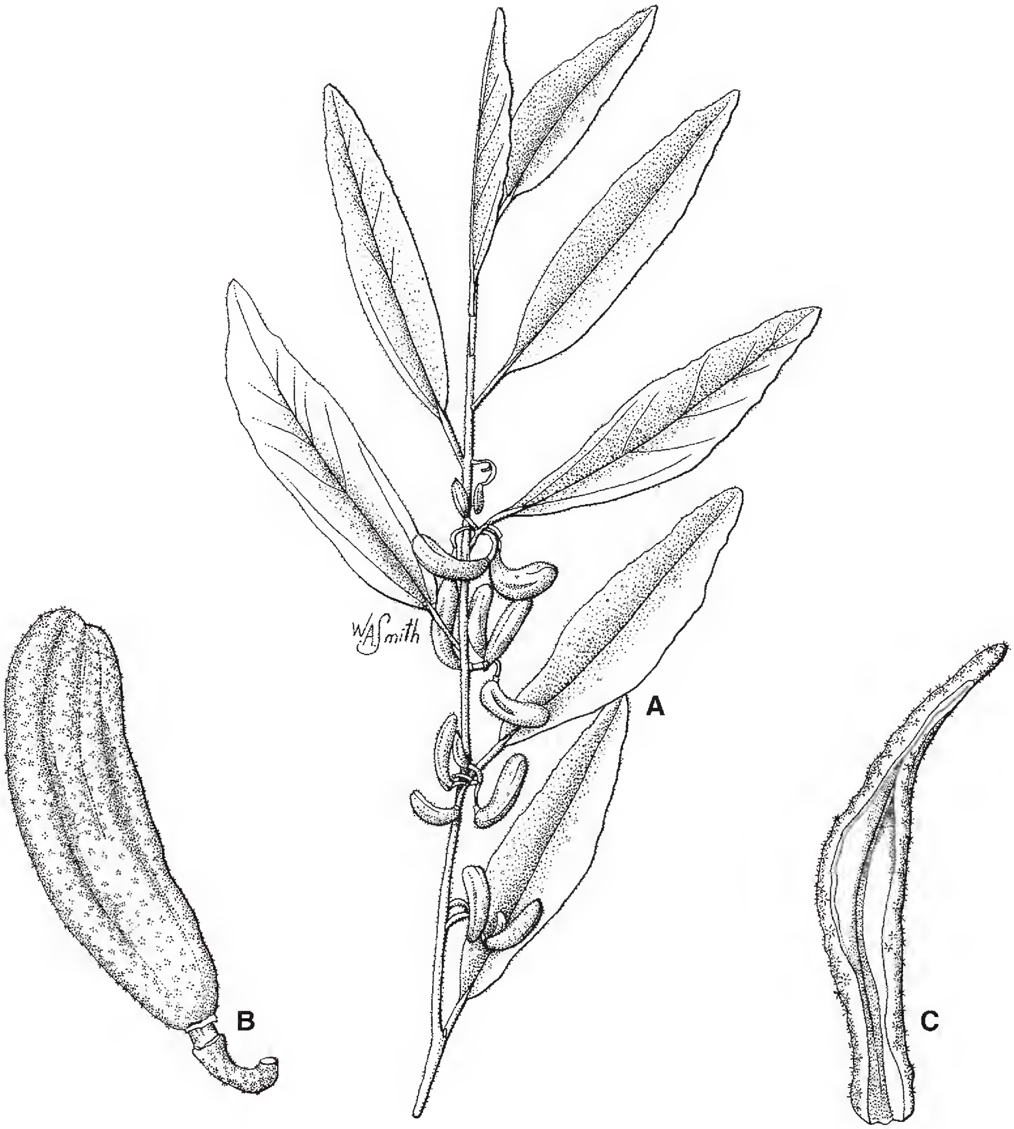

Fig. 1. ***Corchorus aulacocarpus.*** A. branchlet with fruit. × 1. B. fruit. × 4. C. ventral view of sepal. × 8. A, B from *Craven* 6310 (DNA); C from *Hartley* 13886 (DNA). Del. W. Smith.

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long, style 2–4 mm long compared with sepals 9–15 × 2–3 mm, petals 9–10 × 4–7 mm, staminal filaments 4–6 mm long, style 4–6 mm long), shorter peduncles (2–3 mm long compared with 5–7 mm long) and generally narrower leaves (0.8–2.5 cm wide compared with 2–5 cm wide).

***Etymology*:** The specific epithet refers to the longitudinal furrows on the fruit of the species; Greek *aulacos* furrowed, *karpos* fruit.

2. Corchorus carnarvonensis Halford **sp. nov.** videtur arcte affinis *C. sidoidi* et *C. congenero*, ab illo alabastris majoribus (3–6 mm diam. non 1–3 mm diam.), sepalis majoribus (9–11 × 2–3 mm non 3–8 × 1–2 mm), petalis majoribus (6–9 × 4–5 mm non 2–7 × 0.5–4) ab hoc fructibus interdum grandioribus (15–35 × 2–3 mm non 10–18 × 1–2 mm), pilis tantum stellatis non stellato-dendriticis et stellatis vesititis, sepalis majoribus (8–11 × 2–3 non 1–18 × 1–2 mm) differt. **Typus:** Western Australia. Carnarvon District: near Carnarvon, 22 August 1967, *A.M. Ashby* 2321 (holo: PERTH; iso: AD).

Shrub to 0.8 m high; stems much branched, spreading; young shoots with ferruginous indumentum. Indumentum on branchlets, leaves, stipules, peduncles, pedicels and bracts grey-white, dense, comprised of mostly stellate hairs but dendritic-stellate hairs also occasionally present. Stellate hairs sessile or stipitate, up to 0.5 mm across; stipes red-brown, straight up to 0.4 mm long; rays firm, white or ferruginous, up to 0.3 mm long. Leaves with petioles 7–15 mm long; stipules subulate-linear, 4–5 mm long; lamina narrowly oblong or narrowly ovate, 2.5–6 cm long, 0.9–2.4 cm wide, l:w ratio 2.5–3.5:1, concolorous; base rounded; margin serrate; apex acute to obtuse. Inflorescences umbellate, 4–6-flowered, leaf-opposed or lateral, solitary at upper nodes; peduncles 3–5 mm long; pedicels 5–7 mm long, spreading to erect in flower, spreading to recurved in fruit; bracts filiform-linear, 2–3 mm long. Flower buds obovoid-ellipsoid, 3–6 mm across; apex obtuse with 5 spreading caudae to 1 mm long. Sepals 5, not persistent, narrowly obovate, 9–11 mm long, 2–3 mm wide; abaxial surface with a dense indumentum of stellate hairs up to 0.5 mm long; adaxial surface stellate-puberulous proximally, glabrous distally; apex acute or acuminate-caudate, up to 1 mm long. Petals 5; lamina obovate, 6–9 mm long, 4–5 mm wide, glabrous; claw c. 1 mm long, sparsely stellate-pubescent. Androgynophore c. 0.2 mm long; annulus entire, c. 0.2 mm long, glabrous or with scattered minute simple hairs. Stamens 100–120; filaments 4–6 mm long; anthers c. 0.6 mm long. Ovary cylindrical, c. 0.5 mm across, densely stellate-puberulous, 3(rarely 4)-locular, with 20–28 ovules in each locule; style c. 4 mm long. Fruits subcylindrical, 15–35 mm long, 2–3 mm across, 5–15 times longer than wide, curved, circular in transverse section, slightly constricted between seeds, 3(rarely 4)-valved; apex rounded to obtuse, orientated downward; indumentum dense, of stellate hairs up to 0.5 mm long. Seeds compressed obovoid, 1–2 mm long. **Fig. 2.**

***Additional specimens*: Western Australia.** Carnarvon District: 170 km N of Carnarvon junction, Oct 1989, *Nordenstam & Anderberg* 273 (PERTH); 19.7 km S of Coral Bay turnoff, Aug 1977, *Chinnock* 3817 (AD); just N of One Mile Jetty, Carnarvon, Aug 1986, *Chinnock* 6772 (AD); Gascoyne R. flats, Carnarvon, May 1962, *Aplin* 1556 (PERTH); Browns Range, near Carnarvon, Sep 1967, *Hawson* 9 (PERTH); c. 11 km SE of Carnarvon on Geraldton road, adjacent Motor Cycle Club course, Oct 1983, *Forbes* 1573 (MEL).

***Distribution and habitat*:** *Corchorus carnarvonensis* occurs in the north west of Western Australia from near Coral Bay southwards to Carnarvon. A single specimen of this species is labelled as originating from the Port Hedland area (*Runich* [PERTH1523708]). This locality is outside the 'normal' range of this species. The locality is considered to be doubtful and has not been mapped (**Map 3**). The species is recorded as growing in shrubland communities, in sandy soils, on plains and river flats.

***Phenology*:** Flowers and fruits have been collected from August to October.

***Affinities*:** *Corchorus carnarvonensis* seems most closely related to *C. sidoides* and *C. congener.* It can be distinguished from *C. sidoides* by its larger floral buds (3–6 mm across compared with 1–3 mm across), and larger sepals and petals (sepals 9–11 × 2–3 mm compared with 3–8 × 1–2 mm; petals 6–9 × 4–5 mm compared with 2–7 × 0.5–4 mm). For features distinguishing *C. carnarvonensis* from *C. congener* see 'Affinities' section under that species.

***Etymology*:** The specific epithet is derived from the name Carnarvon, plus the suffix *-ensis* indicating place of origin, alluding to the Carnarvon Botanical Province in Western Australia where this species occurs.

3. Corchorus congener Halford **sp. nov.** videtur maxime arcte affinis *C. sidoidi* et *C. carnarvonensi*; ab utroque fructibus stellato-dendriticis vestitis (stellatis tantum in fructibus *C. carnarvonensis* et *C. sidoidis*), et a *C. carnarvonensi* sepalis minoribus (5–8 × 1–2 mm comparitis 9–11 × 2–3 mm), interdum fructibus minoribus (10–18 × 1.5–2.5 mm comparitis 15–35 × 2–3 mm). *Corchorus congener* quoque similis *C. elachocarpo*

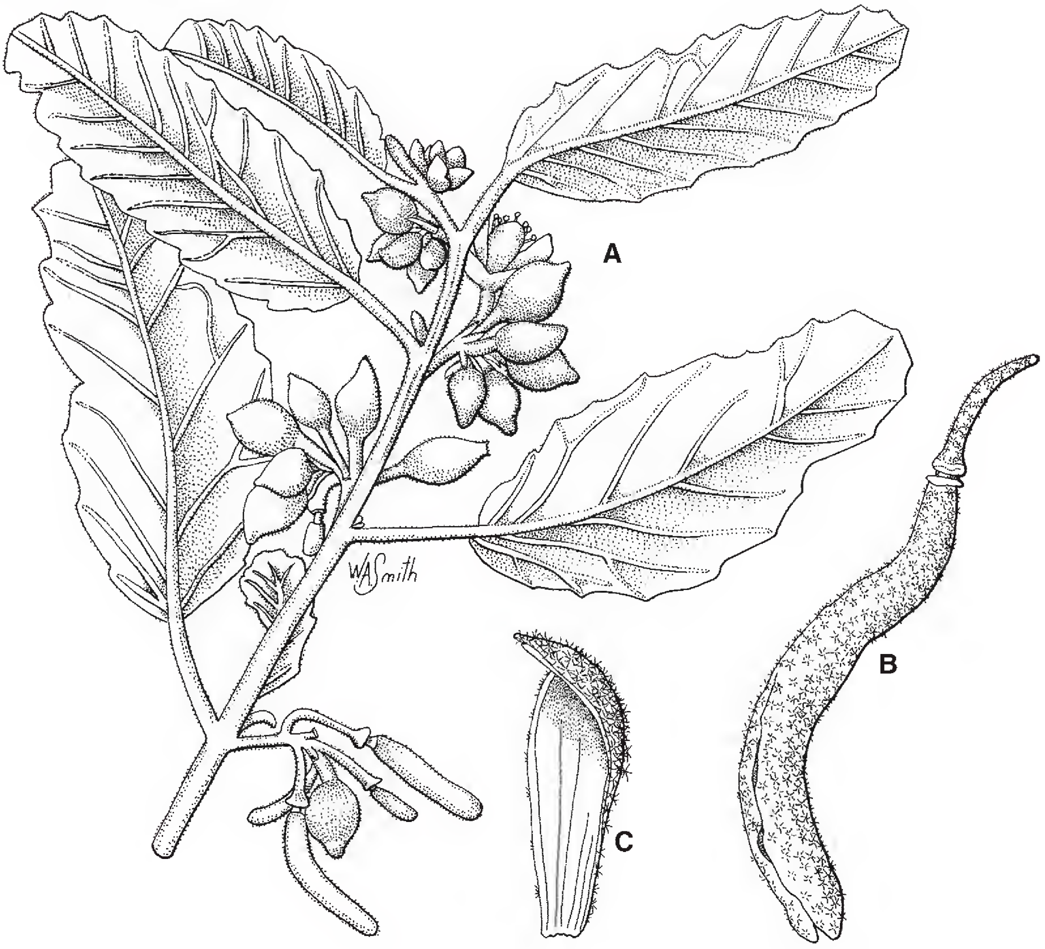

Fig. 2. ***Corchorus carnarvonensis.*** A. branchlet with flowers and immature fruit. × 2. B. fruit. × 3. C. ventral view of sepal. × 6. A from *Chinnock* 3817 (AD); B, C from *Ashby* 2321 (AD). Del. W. Smith.

autem fructibus cylindricis non anguste ellipsoideis vel anguste ovoideus pilis stellato-dendriticis usque 1.5 mm longis non usque 3 mm longis vestitis differt. **Typus:** Western Australia. Fortescue District: N of Yardie Creek, 27 May 1965, *A.S. George* 6671 (holo: PERTH).

Corchorus interstans Halford ms, Paczkowska & Chapman (2000).

Shrub to 0.6 m high; stems much branched, spreading; young shoots with grey-white or ferruginous indumentum. Indumentum on branchlets, leaves, stipules, peduncles, pedicels and bracts grey-white, moderately dense to dense, comprised of stellate hairs. Stellate hairs sessile or stipitate, up to 0.5 mm across; stipes red-brown, straight, up to 0.5 mm long; rays pliable, white or ferruginous, up to 0.3 mm long. Leaves with petioles 5–10 mm long; stipules subulate-linear, 3–5 mm long; lamina narrowly oblong or narrowly ovate, 1.6–5 cm long, 0.5–1.2 cm wide, l:w ratio 3–5:1, discolorous; base rounded to obtuse; margin serrulate; apex obtuse. Inflorescences umbellate, 4–6-flowered, leaf-opposed or lateral, solitary at upper nodes; peduncles 3–7 mm long; pedicels 1–5 mm long, spreading to erect in flower, spreading to recurved in fruit;

bracts filiform-linear, 1–3 mm long. Flower buds obovoid-ellipsoid, 3–4 mm across; apex acute with 5 erect caudae to 0.2 mm long. Sepals 5, not persistent, narrowly obovate-elliptic, 5–8 mm long, 1–2 mm wide; abaxial surface with a moderately dense to dense indumentum of stellate hairs up to 0.5 mm long; adaxial surface glabrous except for a few scattered stellate hairs proximally; apex acute or acuminate-caudate, up to 1 mm long. Petals 5; lamina obovate, 5–7 mm long, 3–5 mm wide, glabrous; claw 0.6–0.7 mm long, stellate-pubescent on margins. Androgynophore c. 0.3 mm long; annulus entire, c. 0.2 mm long, glabrous or with scattered minute simple hairs. Stamens 45–65; filaments 3–5 mm long; anthers c. 0.5 mm long. Ovary trigonal-cylindrical, c. 0.7 mm across, densely stellate puberulous, 3-locular, with 14–18 ovules in each locule; style 3–4 mm long. Fruits subcylindrical, 10–18 mm long, 1.5–2.5 mm across, 5–12 times longer than wide, curved, ± circular in transverse section, not conspicuously constricted between seeds, 3-valved; apex rounded to obtuse; indumentum dense, of stellate and dendritic-stellate hairs; dendritic-stellate up to 1.5 mm long, with stipes pale yellow, tortuous; rays white, up to 0.2 mm long, pliable. Seeds compressed obovoid, 1–2 mm long. **Fig. 3.**

***Selected specimens (from 11 examined)*: Western Australia.** FORTESCUE DISTRICT: Barrow Island, Nov 1965, *Clay & Yardar* s.n. [PERTH1522051] (PERTH). CARNARVON DISTRICT: W side of Cape Range, ± 1 mile [c. 1.6 km] S of lighthouse, Jun 1961, *George* 2563 (PERTH); Exmouth, Oct 1975, *Weber* 4992 (AD); ± 6 miles [c. 10 km] E of Ningaloo Station Homestead, Sep 1970, *George* 10229 (PERTH); 5–6 miles [c. 8–10 km] S of Exmouth, May 1965, *George* 6604 (PERTH); Rough Range, c. 7 km by road S of Exmouth Homestead on main Exmouth–Carnarvon road, Aug 1977, *Barker* 2134 (AD, MEL, NSW).

***Distribution and habitat*:** *Corchorus congener* is confined to north-west of Western Australia, from Ningaloo Station north-east to Barrow Island (**Map 7**). It is recorded as growing in open shrubland and hummock grassland communities, mostly on sandy plains and sand dunes but also on loamy soils derived from limestone.

***Phenology*:** Flowers have been collected from April to June and August to November, fruits in May, August, October and November.

***Affinities*:** *Corchorus congener* seems most closely related to *C. sidoides* and *C. carnarvonensis* but differs from both by having dendritic-stellate hairs on the fruit (only stellate hairs present on the fruits of *C. carnarvonensis* and *C. sidoides*). In addition, *C. congener* differs from *C. carnarvonensis* by having smaller sepals (5–8 × 1–2 mm compared with 9–11 × 2–3 mm), and generally smaller fruit (10–18 × 1.5–2.5 mm compared with 15–35 × 2–3 mm). *Corchorus congener* is also similar to *C. elachocarpus* but differs from that by having cylindrical rather than narrowly ellipsoid or narrowly ovoid fruit with dendritic-stellate hairs up to 1.5 mm rather than up to 3 mm long.

***Notes*:** The collection *Donnell* [MEL1599012] (MEL) from "near the Ord River", is noted here because it is similar to *C. congener* in having narrowly oblong leaves and 3-valved subcylindrical fruits with an indumentum of stellate and dendritic-stellate hairs. However, it differs from *C. congener* in having smaller flowers and a sparser indumentum on its branchlets and leaves. It is also somewhat disjunct from the known populations of *C. congener* in north-west Western Australia. The Donnell collection would appear to represent an undescribed taxon, however, further collections are required before it is formally recognised.

***Etymology*:** The specific epithet alludes to the similarity of this species to *C. carnarvonensis*; Latin *congener* of the same kind.

4. Corchorus crozophorifolius (Baill.) Burret, Notizbl. Bot. Gart., Berlin 12: 166 (1934), ('*chrozophorifolius*'); *Nettoa crozophorifolia* Baill., Adansonia 6: 238 t.7 (1866). **Type:** [Western Australia.] Nova Holland, ile sterile, *Leschenault* [Baudin Expedition] (lecto, here chosen: P; isolecto: P).

Corchorus crassifolius Domin, Biblioth. Bot. 89: 384 (1928). **Type:** [Western Australia.] upper Murchison River near Mt Hall, 1884, *C. Crossland* (holo: K; iso: MEL).

Shrub to 1 m high; stems much branched, spreading to erect; young shoots with ferruginous indumentum. Indumentum on

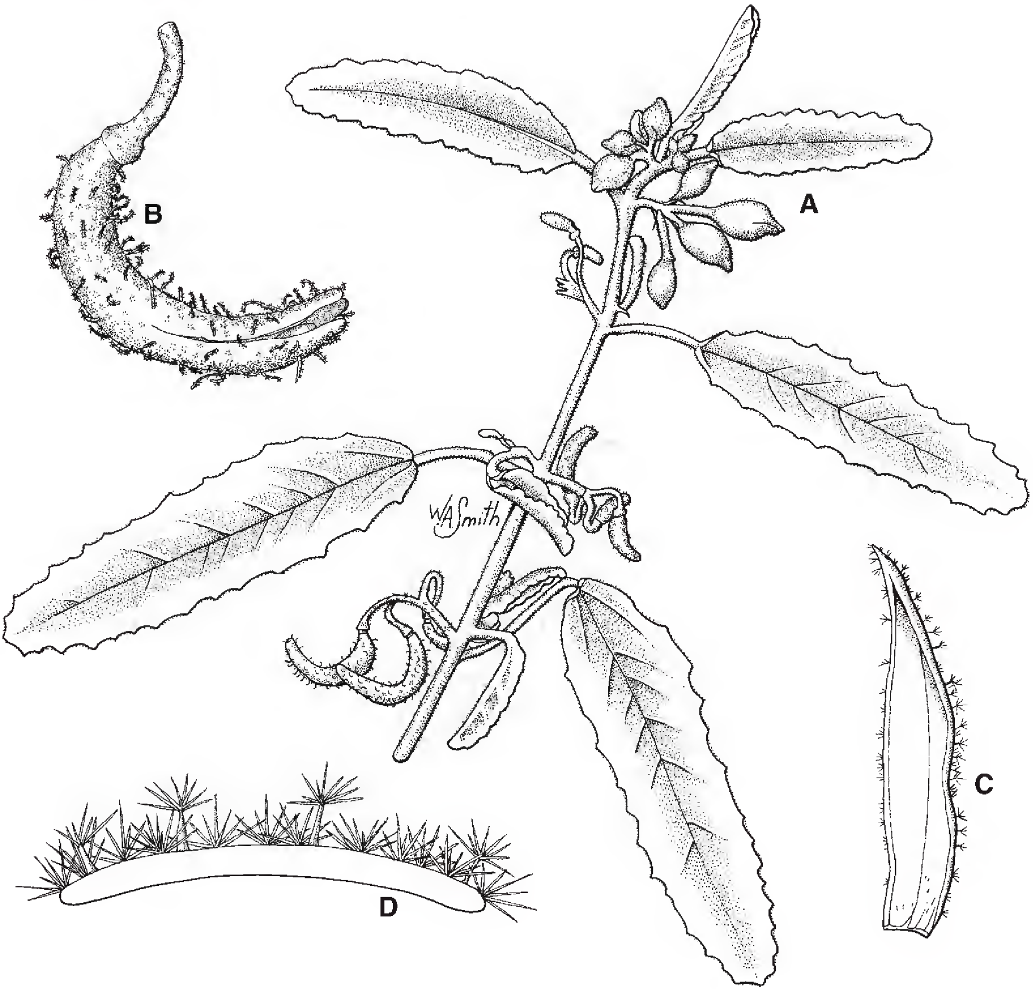

Fig. 3. ***Corchorus congener.*** A. branchlet with flower buds and fruit. × 1.5. B. fruit. × 3. C. ventral view of sepal. × 8. D. cross-section of sepal. × 36. A–D from *George* 6671 (PERTH). Del. W. Smith.

branchlets, leaves, stipules, peduncles, pedicels and bracts ferruginous or rarely grey-white, very dense, floccose, comprised of mostly dendritic-stellate and stellate hairs but simple hairs also present. Stellate hairs sessile or stipitate, up to 0.9 mm across; stipes red-brown or white, straight, up to 0.2 mm long; rays firm to pliable, ferruginous or white, up to 0.5 mm long. Dendritic-stellate hairs up to 4 mm long; stipes red-brown or pale yellow, tortuous; rays firm to pliable, white or ferruginous, up to 0.8 mm long. Simple hairs glandular, white, flexuous, up to 0.3 mm long. Leaves with petioles 10–25 mm long; stipules subulate-linear, 4–20 mm long; lamina ovate, (3–)4–9 cm long, 2–6 cm wide, l:w ratio 2–4:1, concolorous; base rounded; margin dentate-serrate; apex acute to rounded. Inflorescences umbellate, 4–15-flowered, leaf-opposed, solitary at upper nodes; peduncles 5–20 mm long; pedicels 2–12 mm long, spreading to erect in flower and fruit; bracts subulate-linear, 5–12 mm long. Flower buds ellipsoid, 6–10 mm across; apex obtuse occasionally with 5 spreading caudae to 1 mm long. Sepals 5, persistent, narrowly obovate-elliptic, 10–18 mm long, 2–4 mm wide; abaxial surface with a very dense indumentum of dendritic-stellate and stellate hairs, the largest hairs up to 2 mm long; adaxial surface stellate-villose proximally, glabrous distally; apex acute or caudate, up to 6 mm long. Petals 5; lamina obovate, 8–11 mm long, 3–6 mm wide, glabrous; claw 1–1.5 mm long, stellate-villose on abaxial surface and margins. Androgynophore 0.5–0.7 mm long; annulus entire, c. 0.5 mm long, densely stellate-pubescent. Stamens 50–100; filaments 3–8 mm long; anthers c. 0.8 mm long. Ovary ovoid to cylindrical, densely stellate-tomentose, 3 to 7-locular, with 16–30 ovules in each locule; style c. 5 mm long. Fruits ovoid, 12–17 mm long, 10–12 mm across, 1–1.7 times longer than wide, circular in transverse section, 4 to 6-valved; apex rounded; indumentum dense, of dendritic-stellate and stellate hairs, the largest hairs c. 4 mm long. Seeds compressed obovoid, c. 2 mm long.

***Selected specimens (from 52 examined)*:** **Western Australia.** FORTESCUE DISTRICT: 7 km NW of Quarry Hill, c.130 km W of Tom Price, Jul 1984, *Newbey* 10586 (PERTH); 33 km SE of Mt Bruce, May 1980, *Houston* s.n. [PERTH1522892] (PERTH). CARNARVON DISTRICT: 120 km S of Onslow, May 1962 *Aplin* 1603 (MEL, PERTH); near Carnarvon, Jul 1965, *Ashby* 1563 (AD, CANB); 7 km N of Gascoyne Junction, Oct 1984, *Mitchell* 1312 (PERTH); 16 km N of Gascoyne Junction, Sep 1987, *Green* 5391 (PERTH); 166 km SSE of Carnarvon, on North West Coastal Highway, Aug 1965, *Beauglehole* ACB11795 (PERTH); Woodleigh Station, E of Perth–Carnarvon road, Sep 1959, *Burbidge* 6366 (PERTH); 30 miles [c. 48 km] E of Hamelin Pool, Aug 1931, *Gardner* 2542 (PERTH). ASHBURTON DISTRICT: Barlee Range, Henry R., Aug 1961, *Royce* 6599 (PERTH); 50 km NW of Cobra Homestead on Gascoyne Junction to Mt Augustus road near Lyons R., Jul 1986, *Conrick* 9851 (MEL); Mount Sandiman Station, Aug 1969, *Wilcox* 40 (PERTH); Mt Augustus, Aug 1970, *Ashby* 3372 (AD, MEL). AUSTIN DISTRICT: near Mount Gould, flumen Murchison, Aug 1963, *Gardner* 14529 (PERTH); 20.7 miles [c. 33 km] N of Belele, Jul 1958, *Speck* 945 (CANB); 12 miles [c. 19 km] SE of Berrugarra [Beringarra], Sep 1957, *Speck* 675A (CANB); 10 miles [c. 16 km] W of Mileura on Nookawarra road, Jul 1958, *Speck* 1006 (CANB, MEL); 10 miles [c. 16 km] S of Berrugarra [Beringarra], Jul 1958, *Speck* 976 (AD, CANB); 2.2 km ENE of Pepper Tree Bore, Koonanarra [Koonmarra] Station, Aug 1986, *Cranfield* 5927 (PERTH); Wiluna area, Dec 1970, *Morrissey* 51 (PERTH).

***Distribution and habitat*:** *Corchorus crozophorifolius* is confined to the north-west of Western Australia, from Exmouth southwards to Woodleigh Station (south of Carnarvon) and east to Wiluna (**Map 1**). It is recorded as growing in *Acacia* shrubland and woodland communities, on sandy soils on alluvial flats and along watercourses, and on skeletal soils derived from limestone or granite on rocky rises and hills.

***Phenology*:** Flowers have been collected from May to November, fruits from July to November.

***Typification*:** Baillon (1866) cited a collection from the Baudin expedition in the protologue of *Nettoa crozophorifolius*. I have seen two sheets of original material of *N. crozophorifolius* from the Baudin expedition on loan to BRI from P. The sheet with the hand written label "(Leschenault legit!) Tiliaceae, Nova Holland ile sterile" is selected as lectotype because it agrees with the original description and the fragment at the top left of the sheet matches the drawing with Baillon's original description.

***Notes*:** *Corchorus crozophorifolius* is a distinctive species with its floccose indumentum on the stems, petioles and inflorescences, and its densely hairy annulus. There are two indumentum colour forms. The typical and more widespread form has an indumentum of ferruginous hairs on the young shoots and buds. The other form has an indumentum of white hairs (eg. *Newbey* 10586 (PERTH), *Aplin* 1603 (MEL, PERTH) and *Ashby* 4143 (AD, PERTH)) and is found mostly in the northern part of the species range. The white form of *C. crozophorifolius* may be confused with *C. incanus* but is easily distinguished by having a densely hairy annulus.

The collections *Weber* 4928 (AD), *George* 1362 (PERTH), *McWhae* s.n. [PERTH1522825] and *George* 1343 (PERTH) from Cape Range near Learmonth resemble *C. crozophorifolius* in their indumentum and floral morphology but differ by having cylindrical fruits (15–20 mm × 4–5 mm) and a much finer serration on the leaf margin. This variant needs to be investigated further and may be worth recognising at least at a subspecific rank if not as a distinct species.

5. Corchorus elachocarpus F.Muell., Fragm. 8: 6 (1872). **Type:** [Western Australia.] Nichol Bay, *P. Walcott* (lecto: MEL [MEL223670], *fide* B. Rye, *Nuytsia* 9(3): 418 (1994)).

Shrub to 0.6 m high; stems sparingly to much branched, spreading; young shoots with grey-white or rarely ferruginous indumentum. Indumentum on branchlets, leaves, stipules, peduncles, pedicels and bracts grey-white, moderately dense to dense, comprised of stellate hairs. Stellate hairs sessile or sometimes stipitate, up to 0.6 mm across; stipes red-brown, straight, up to 0.1 mm long; rays pliable, white, up to 0.4 mm long. Leaves with petioles 4–13 mm long; stipules subulate-linear, 2–3 mm long; lamina narrowly oblong, 2–5 cm long, 0.4–1.3 cm wide, l:w ratio 2–5:1, concolorous; base rounded; margin serrulate; apex obtuse. Inflorescences umbellate, 3–7-flowered, leaf-opposed, solitary at upper nodes; peduncles 2–4 mm long; pedicels 1–2 mm long, spreading to erect in flower, spreading to recurved in fruit; bracts subulate-linear, 1–2 mm long. Flower buds globose, 2–3 mm across; apex obtuse with 5 erect caudae to 0.5 mm long. Sepals 5, not persistent, narrowly obovate-elliptic, 4–6 mm long, 1–2 mm wide; abaxial surface with a dense indumentum of stellate hairs up to 0.5 mm long; adaxial surface glabrous or with a few scattered stellate hairs proximally; apex shortly caudate, up to 1 mm long. Petals 5; lamina obovate to broadly obovate, 3–5 mm long, 3–4 mm wide, glabrous; claw 0.5–0.7 mm long, sparsely stellate-pubescent. Androgynophore 0.5–0.8 mm long; annulus entire, c. 0.2 mm long, glabrous. Stamens 27–42; filaments 3–4 mm long; anthers c. 0.5 mm long. Ovary ovoid, 1–1.5 mm across, densely stellate-tomentose, 3(rarely 4)-locular, with 6–8 ovules in each locule; style 3–4 mm long. Fruits narrowly ellipsoid or narrowly ovoid, 4–10 mm long, 1–4 mm across, 2.5–4 times longer than wide, not conspicuously constricted between seeds, circular in transverse section, 3(rarely 4)-valved; apex rounded to obtuse; indumentum dense, of dendritic-stellate and stellate hairs, the largest hairs up to 3 mm long. Seeds obovoid, c. 2 mm long. Chromosome No. 2n = 14 (Islam & Qaiyum 1961).

***Selected specimens (from 13 examined)*: Western Australia.** FORTESCUE DISTRICT: 30–40 km S of Port Hedland, Jun 1982, *Glennon* 76 (PERTH); Warralong, Aug 1941, *Burbidge* s.n. [PERTH1532278] (PERTH); Muccan Station, De Grey R., Jun 1941, *Burbidge* 966 (PERTH); 4.5 km W of "Warrawagine" Homestead, c. 65 km SE of Shay Gap, Jul 1984, *Newbey* 10541 (CANB, PERTH); Main Shay Gap–Marble Bar road, c. 6 km by road SW of turnoff to Kittys Gap Well, Aug 1977, *Barker* 2084 (AD); 3 miles [c. 5 km] S of Stag Arrow Creek, May 1947, *Royce* 1703 (PERTH); 4 miles [c. 6 km] N of Stag Arrow Creek, May 1947, *Royce* 1715 (PERTH). CARNARVON DISTRICT. c. 15 km N of crossing from North West Coastal Highway towards Yanrey, Oct 1975, *Weber* 4890 (PERTH); Marilla Station complex, Oct 1984, *Stretch* s.n. [PERTH1532243] (PERTH); Carnarvon Geraldton road, Sep 1968, *Baird* s.n. [PERTH1532723] (PERTH).

***Distribution and habitat*:** *Corchorus elachocarpus* is confined to the Pilbara region of Western Australia from near Yanrey Station eastwards to Warrawagine Station and Stag Arrow Creek (**Map 6**). It is recorded as growing in hummock grassland and open shrubland communities, on sandy or sandy clay soils on flats.

***Phenology*:** Flowers have been collected from May to October, fruits in May, June, August and October.

***Notes*:** The collections *Mitchell* PRP1462 (BRI) and *Mitchell* PRP1135 (BRI) from Marrillana Station near Newman represent an undescribed entity closely related to *C. elachocarpus*. It differs from *C. elachocarpus* in having narrowly ovate leaves, longer peduncles and pedicels, and broader fruit. This entity warrants formal recognition. However, more material is required before this can be undertaken.

The collection *George* [PERTH1532251] (PERTH) from the Great Sandy Desert, is noted here because it is similar to *C. elachocarpus* but differs in having much larger leaves, fruits and flowers. Even from this single specimen, it is clear that the entity it represents warrants formal recognition. However, more material is required before this can be undertaken.

6. Corchorus elderi F.Muell., Trans. & Proc. Roy. Soc. South Australia 9: 58 (1887). **Type:** [Northern Territory.] N of Macdonell Range, 1886, *Lt Dittrich* (lecto, here chosen: MEL [MEL223672]; isolecto: AD [AD95836005], MEL [MEL223671]).

Shrub to 0.4 m high; stems much branched, spreading to erect. Indumentum on young shoots, branchlets, stipules, peduncles, pedicels and bracts ± white, sparse to moderately dense, comprised of stellate hairs. Stellate hairs sessile, up to 0.6 mm across; rays pliable, white, up to 0.4 mm long. Leaves with petioles 2–13 mm long; stipules subulate-linear, 1–3 mm long; lamina narrowly oblong-elliptic, 1–4 cm long, 0.5–1.5 cm wide, concolorous; adaxial surface glabrous or sparsely stellate hairy; abaxial surface moderately dense to densely stellate hairy; base obtuse to rounded; margin serrate or serrulate; apex obtuse. Inflorescences umbellate, 2 or 3-flowered, lateral, solitary at nodes; peduncles 1–5 mm long; pedicels 2–7 mm long, spreading to erect in flower and fruit; bracts subulate-linear, 1–2 mm long. Flower buds broadly obovoid, 2–4 mm across; apex obtuse or shortly acuminate. Sepals 5, not persistent, narrowly obovate-elliptic, 6–7 mm long, 1–2 mm wide; abaxial surface with a moderately dense indumentum of stellate hairs up to 0.3 mm long; adaxial surface glabrous; apex acute or shortly caudate, up to 0.5 mm long. Petals 5; lamina obovate, 5–7 mm long, 2–4 mm wide, glabrous; claw c. 1 mm long, stellate-pubescent on margins. Androgynophore 0.2–0.5 mm long; annulus undulate, c. 0.2 mm long, glabrous. Stamens 40–60; filaments 3–4 mm long; anthers c. 0.5 mm long. Ovary ovoid, 1.5–2 mm across, densely stellate-tomentose, 5 or 6-locular, with c. 20 ovules in each locule; style 2–3 mm long. Fruits ellipsoid to broadly ellipsoid, 5–10 mm long, 4–8 mm across, 1.2–2.4 times longer than wide, not conspicuously constricted between seeds, circular in transverse section, 4 or 5-valved; apex rounded; indumentum dense, of stellate and dendritic-stellate hairs up to 1.5 mm long. Seeds compressed obovoid, 1–2 mm long.

Selected specimens (from 12 examined)**: Northern Territory.** CENTRAL NORTHERN REGION: Trew Bore, Elkedra Station, Dec 1986, *Strong* 947 (DNA); 5 miles [c. 8 km] W of Tarlton Downs Homestead, Feb 1968, *Latz* 156 (AD, BRI, DNA, MEL, NSW); Plenty Highway, 72 km E of Arthur R., May 1988, *Thomson* 2433 (DNA). CENTRAL SOUTHERN REGION: sandy flat on western side of Hay R., c. 14 km SSE of Mt Winnecke, Jul 1982, *Purdie* 2323 (CANB, DNA); Lake Caroline, Oct 1986, *Leach* 1039 (BRI). **Queensland.** GREGORY NORTH DISTRICT: sandplain at mouth of Toko Gorge, Toko Range, Jul 1982, *Purdie* 2285 (BRI, CANB); levee adjacent to Burke R., 2 km S of Boulia, Sep 1978, *Purdie* 1328 (BRI).

Distribution and habitat**:** *Corchorus elderi* is not a common species over its range from the Davenport Ranges, Northern Territory eastwards to Boulia, in western Queensland (**Map 1**). It is recorded as growing in low to tall open *Acacia* shrubland or open eucalypt woodland communities, on red sandy soils on flats or ridges.

Phenology**:** Flowers have been collected in February, May, July and from September to December, fruits in May, July and from September to December.

Typification**:** In the protologue of *Corchorus elderi*, Mueller (1887) cited a collection made by Lieut. Dittrich from a region north of the MacDonnell Ranges. Three sheets (two at MEL [MEL223671; MEL223672] and one sheet at AD [AD95836005]) of Dittrich's collection from this area have been located. The MEL sheet marked MEL223672 is here chosen as the lectotype as it is the better preserved of the three specimens seen.

7. Corchorus incanus Halford **sp. nov.** similis *C. walcottii* et *C. lanifloro*. Ab utroque pilis conspicuis simplicibus glandularibus deficientibus differt. Addite ab illo lobis calycis persistentibus in fructibus, pilis longioribus (3–5 non usque 1.5 mm longis) in fructibus et in pagina abaxiali sepalium differt. *Corchorus incanus* confunderi potest variantia albiflora *C. crozophorifolii* autem ab illo annulo glabro pubescente distinguendus. **Typus:** Western Australia. FORTESCUE DISTRICT: Great Northern Highway–Shellborough track, c. 35 km NNW of Goldsworthy, 6 August 1977, *I.R. Telford* 6524 & *G. Butler* (holo: CANB; iso: BRI, PERTH, distribuendi).

Shrub to 1 m high, sometimes viscid; stems much branched. Indumentum on young shoots, branchlets, leaves, stipules, peduncles, pedicels and bracts grey-white, moderately dense to dense, comprised of mostly stellate hairs but dendritic-stellate and simple hairs also occasionally present. Stellate hairs sessile or stipitate, up to 2 mm across; stipes red-brown to white, straight or tortuous, up to 0.8 mm long; rays soft, white, spreading, up to 1.5 mm long. Dendritic-stellate hairs up to 1.5 mm long; stipes red-brown, tortuous; rays soft, white, up to 0.8 mm long. Simple hairs glandular, white, flexuous, up to 0.5 mm long. Leaves with petioles 15–30 mm long; stipules subulate-linear, 8–20 mm long; lamina ovate to very broadly ovate, 3–8.5 cm long, 2–7 cm wide, l:w ratio 1.2–1.6:1, concolorous or slightly discolorous; base rounded or slightly cordate; margin serrate; apex rounded to obtuse. Inflorescences umbellate, 4–7-flowered, leaf-opposed, solitary at nodes; peduncles 7–25 mm long; pedicels 2–10 mm long, spreading to erect in flower and fruit; bracts filiform-linear; 8–25 mm long. Flower buds broadly ellipsoid, 7–10 mm across; apex obtuse with 5 spreading caudae to 8 mm long. Sepals 5, persistent, narrowly elliptic, 8–16 mm long, 1–5 mm wide; abaxial surface with a dense indumentum of mostly dendritic-stellate hairs but stellate hairs also present, the largest hairs c. 3 mm long; adaxial surface stellate-villose proximally, glabrous distally; apex caudate, 3–6 mm long. Petals 5; lamina obovate, 6–9 mm long, 4–5 mm wide, glabrous; claw c. 1 mm long, with stellate-pubescent margins. Androgynophore 0.1–0.3 mm long; annulus entire, 0.2–0.4 mm long, glabrous or rarely with scattered hairs. Stamens 100–120; filaments 4–6 mm long; anthers c. 0.5 mm long. Ovary subglobose, 1–2 mm across, densely stellate-tomentose; 4 or 5-locular, with 10–24 ovules in each locule; style 2–6 mm long. Fruits subcylindrical or ovoid, 8–17 mm long, 5–10 mm across, 1.6–2.5 times longer than wide, not conspicuously constricted between seeds, ± circular in transverse section, 4 or 5-valved; apex obtuse; indumentum dense, of stellate and dendritic-stellate hairs, the largest hairs c. 5 mm long. Seeds compressed obovoid, 2–3 mm long.

Affinities**:** *Corchorus incanus* resembles *C. walcottii* and *C. laniflorus* but differs from both by lacking conspicuous simple glandular hairs. In addition, *C. incanus* differs from *C. walcottii* by having persistent sepals and longer hairs on the fruits and the abaxial surface of the sepals (3–5 mm long compared with 1.5 mm long). *Corchorus incanus* may be confused with the white form of *C. crozophorifolius* but it can be distinguished from that by its more or less glabrous rather than densely hairy annulus. *Corchorus incanus* can be confused with *C. lasiocarpus* but differs from that by its relative shorter leaves and narrower fruits.

Etymology**:** The specific epithet alludes to the overall greyish-white appearance of the whole plant; Latin *incanus* quite grey, hoary.

Notes**:** This species occurs in the north-west of Western Australia, from Hamersley Range, near Wittenoom northwards to Port Hedland and Broome with an isolated record from the Rudall River on the south eastern edge of the Great Sandy Desert. Two subspecies are recognised here.

Indumentum on branchlet dense with stellate hairs mostly ≤ 1 mm across; plants generally growing on sandy soils on sandhills, plains and along watercourses . . . . **7a. C. incanus** subsp. **incanus**

Indumentum on branchlets moderately dense with stellate hairs mostly 1–2 mm across; plants growing on stony soils along watercourses and in gorges . . . . **7b. C. incanus** subsp. **lithophilus**

7a. Corchorus incanus Halford subsp. incanus

Shrub to 1 m high, sometimes viscid. Stellate hairs sessile or stipitate, up to 1.5 mm across; stipes straight or tortuous, up to 0.8 mm long; rays up to 1.5 mm long. Dendritic-stellate hairs up to 1.5 mm long; rays up to 0.8 mm long. Leaves with petioles 15–25 mm long; lamina broadly ovate to very broadly ovate, sometimes ovate, 3.5–8.5 cm long, 2.5–7 cm wide. Inflorescences 5–7-flowered; peduncles 7–25 mm long; pedicels 2–10 mm long; bracts 8–12 mm long. Sepals 12–16 mm long, 1–3 mm wide. Petals obovate, 6–9 mm long, 4–5 mm wide. Fruits subcylindrical or ovoid, 8–15 mm long, 5–10 mm across; dendritic-stellate hairs c. 5 mm long. **Fig. 4.**

Selected specimens (from 23 examined)**: Western Australia.** DAMPIER DISTRICT: 1 mile [c. 1.6 km] N of Broome, May 1971, *Maconochie* 1174 (CANB, DNA, MEL, NSW, PERTH); 407 km from Port Hedland (P.O.) along Great Northern Highway towards Broome, Apr 1992, *Telford* 11587 (BRI); 7.5 km SW of the 80 Mile Beach turnoff, Sep 1986, *Chinnock* 6941 (AD); Nalgi Station, 80 Mile Beach, June 1941, *Burbidge* 1261 (PERTH); 2 km E of Nita Downs Homestead, Oct 1984, *Foulkes* 37 (PERTH); 86 km NE of Sandfire roadhouse, Great Northern Highway, Sep 1978, *Beauglehole* 59257 & *Erroy* 2957 (DNA); 124 miles [c. 200 km] SW of Anna Plains, SW of Broome, Aug 1965, *Beauglehole* ACB11326 (MEL, PERTH). FORTESCUE DISTRICT: Port Hedland, Feb 1983, *Rose* 2 (PERTH); Poondarrah Siding, Port Hedland–Marble Bar railway, May 1941, *Burbidge* 662 (PERTH); Finucane Island, Mar 1981, *Carr* B4 (PERTH); Shellborough track, c. 35 km NNW of Goldsworthy, Aug 1977, *Telford & Butler* 6524 (PERTH); Pier Creek, Warralong Station, May 1941, *Burbidge* 738 (PERTH); Warralong Station, between Shaw and Coongan

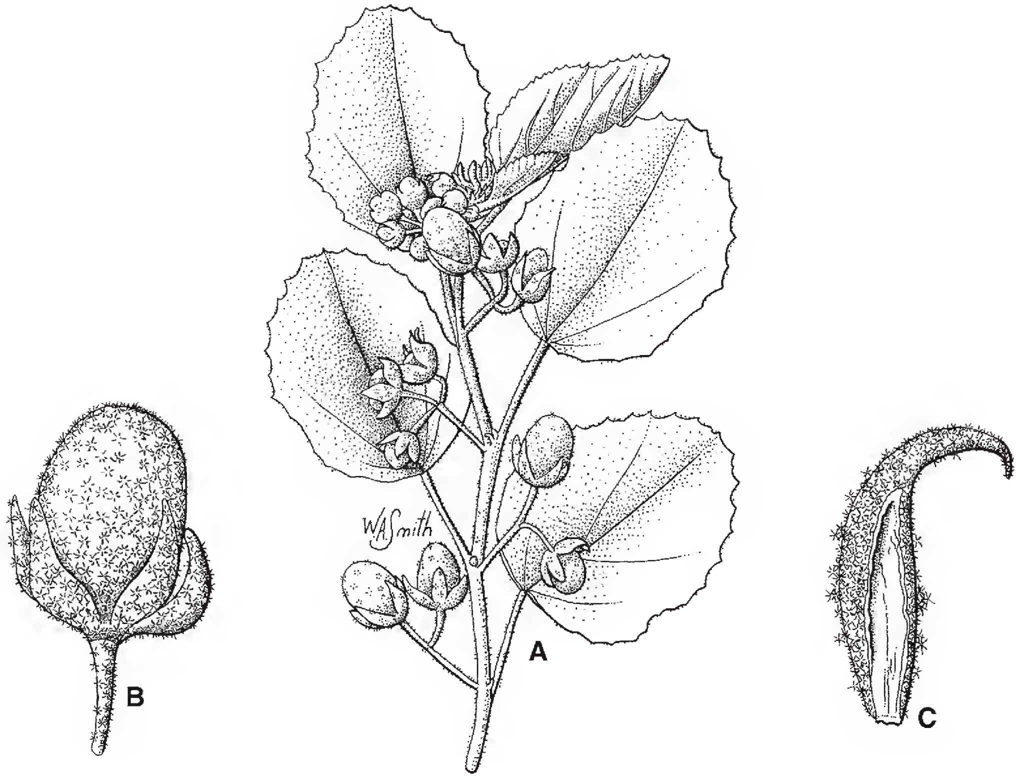

Fig. 4. ***Corchorus incanus*** subsp. ***incanus.*** A. branchlet with flowers and fruit. × 0.6. B. fruit. × 2. C. ventral view of sepal. × 4. A–C from *Telford* 6524 & *Butler* (BRI). Del. W. Smith.

Rivers, Jun 1941, *Burbidge* 1217 (PERTH). Keartland District: near Rudall R., May 1971, *George* 10780 (CANB, PERTH); Rudall R., Aug 1971, *Wilson* 10303 (PERTH).

***Distribution and habitat*:** *Corchorus incanus* subsp. *incanus* occurs from Port Hedland to Broome with an isolated record from Rudall River on the south-eastern edge of the Great Sandy Desert (**Map 7**). It is recorded as growing in low open shrubland or low open woodland communities, on sandy or rarely clayey sandy soils, on sandhills, plains or along watercourses.

***Phenology*:** Flowers have been collected in February and from April to September, fruits in June and from August and September.

7b. Corchorus incanus subsp. **lithophilus** Halford **subsp. nov.** a subspeciebus ceteris plantis plerumque viscidis, indumento pilorum stellatorum grossiorum differt. Crescit in solis saxosis circum flumina in tempus et saltus in comparatione in solis arenosis in clivis sabulosis et planitiis. *Corchorus incanus* subsp. *lithophilus* confunderi potest *C. incano* subsp. *lasiocarpo* foliis ovatis usque late ovatis non anguste ovatis usque ovatis marginibus grossiore serratis, fructibus minoribus (13–17 × 6–7 mm non 15–20 × 12–16 mm) distinguendus. **Typus:** Western Australia. Fortescue District: Hamersley Range NP, Kalamina Gorge, below car park, 19 Aug 1977, *W.R. Barker* 1994 (holo: AD).

Corchorus lithophilus Halford ms, Paczkowska & Chapman (2000).

Corchorus saxicola Halford ms, Paczkowska & Chapman (2000).

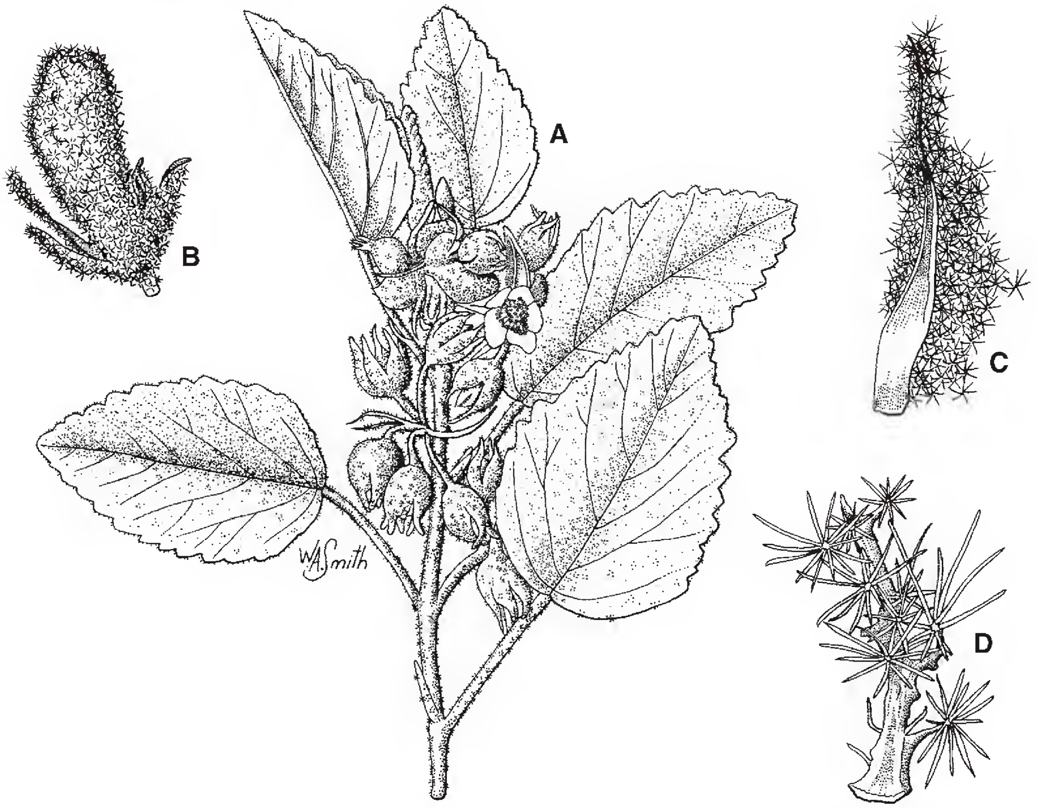

Fig. 5. ***Corchorus incanus*** subsp. ***lithophilus.*** A. branchlet with flower buds and flowers. × 0.6. B. fruit. × 2. C. ventral view of sepal. × 4. D. dendritic-stellate hair. × 24. A from *Craven* 7548 (CANB); B–D from *Barker* 1994 (AD). Del. W. Smith.

Shrub to 1 m high, usually conspicuously viscid. Stellate hairs sessile or stipitate, up to 2 mm across; stipes straight, up to 1 mm long; rays up to 2 mm long. Dendritic-stellate hairs up to 2 mm long; rays up to 1.5 mm long. Leaves with petioles 10–35 mm long; lamina ovate to broadly ovate, 3–8 cm long, 2–5.5 cm wide. Inflorescences 4–6-flowered; peduncles 8–10 mm long; pedicels 7–10 mm long; bracts 10–25 mm long. Sepals 8–16 mm long, 2–5 mm wide. Petals obovate to broadly obovate, 7–8 mm long, 5–7 mm wide. Fruits subcylindrical, 13–17 mm long, 6–7 mm across; dendritic-stellate hairs c. 3 mm long. **Fig. 5.**

***Additional specimens*:** **Western Australia.** FORTESCUE DISTRICT: near racecourse, Wittenoom, Oct 1963, *Lullfitz* L2758 (PERTH); Wittenoom, Aug/Sep 1957, *Elliott* s.n. [PERTH1522574] (PERTH); near Wittenoom, Aug 1967, *Gittins* 1480 (NSW, PERTH); Hamersley Range, near Wittenoom Gorge, May 1958, *Burbidge* 6001 (PERTH), Wittenoom Gorge, Sep 1969, *Brooker* 2218a (PERTH); Hamersley Range NP, Fig Tree Soak, c. 10 km by road SW into Yampire Gorge from Wittenoom–Roy Hill road, Aug 1977, *Barker* 1966 (AD) c. 17 km E of Wittenoom on Roy Hill to Wittenoom road, Aug 1996, *Mitchell* PRP1463 (BRI); 15 km E of Wittenoom on the Roy Hill road, Sep 1982, *Craven* 7548 (CANB, MEL, PERTH).

***Distribution and habitat*:** *Corchorus incanus* subsp. *lithophilus* occurs in the Hamersley Range, near Wittenoom (**Map 6**). It is recorded as growing in hummock grassland communities on stony soils and along watercourses in low open woodland communities.

***Phenology*:** Flowers have been collected in May and from August to October, fruits in August.

***Affinities*:** *Corchorus incanus* subsp. *lithophilus* differs from the other subspecies by having a sparser indumentum of coarser stellate hairs and its plants are usually conspicuously sticky. Its habitat differs also as it grows in stony soils around creeks and gorges rather than sandy soils on sandhills, plains or along watercourses. *Corchorus incanus* subsp. *lithophilus* may be confused with *C. lasiocarpus* subsp. *lasiocarpus* but can be distinguished from that by its ovate to broadly ovate rather than narrowly ovate to ovate leaves, coarser serrated leaf margins and smaller fruit (13–17 × 6–7 mm compared with 15–20 × 12–16 mm).

***Etymology*:** The subspecific epithet refers to the rocky habitat; Greek *lithos* stone, *philus* loving, fond.

8. Corchorus laniflorus Rye, Nuytsia 9(3): 416 (1994). **Type:** Western Australia. FORTESCUE DISTRICT: Red Hill, 20 October 1941, *C.A. Gardner* 6348 (holo: PERTH *n.v.*; iso: CANB *n.v.*).

Compact shrub to 1(–1.2) m high; stems much branched, spreading. Indumentum on young shoots, branchlets, leaves, stipules, peduncles, pedicels and bracts grey-white, dense, woolly, comprised of mostly stellate and simple hairs but dendritic-stellate hairs also occasionally present. Stellate hairs sessile or stipitate, up to 2 mm across; stipes red-brown, tortuous, up to 0.7 mm long; rays soft, white, up to 2 mm long. Dendritic-stellate hairs up to 5 mm long; stipes up to 3 mm long; rays soft, white, 1–2.5 mm long. Simple hairs glandular, dull yellow to red-brown, flexuous, up to 1.5 mm long. Leaves with petioles 8–15(–30) mm long; stipules subulate-linear, 7–17 mm long; lamina ovate to very broadly ovate, 1.5–5 cm long, 1–4 cm wide, l:w ratio 1.1–1.7:1, concolorous or slightly discolorous; base rounded or slightly cordate; margin serrate or dentate-serrate; apex obtuse to rounded. Inflorescences umbellate, 5 or 6-flowered, leaf-opposed, solitary at nodes; peduncles 10–14 mm long; pedicels 5–9 mm long, spreading to erect in flower and fruit; bracts filiform-linear, 6–10 mm long. Flower buds globose, 5–12 mm across; apex obtuse with 5 spreading caudae to 4 mm long. Sepals 5, persistent, narrowly obovate-elliptic, 10–15 mm long, 2–3 mm wide; abaxial surface with a very dense indumentum of dendritic-stellate and simple hairs, the largest hairs up to 5 mm long; adaxial surface densely stellate hairy or ± glabrous; apex caudate, 4–6 mm long. Petals 5; lamina obovate to very broadly obovate, 6–10 mm long, 5–9 mm wide, glabrous; claw c. 1 mm long, stellate-pubescent on abaxial surface, with ciliate margins. Androgynophore 0.4–0.5 mm long; annulus undulate, up to 0.4 mm long, glabrous. Stamens 80–100; filaments 3–4 mm long; anthers c. 0.5 mm long. Ovary subglobose, c. 1.5 mm across, densely stellate-tomentose, 3 or 4(rarely 5)-locular, with 6–8 ovules in each locule; style 3–5 mm long. Fruits narrowly ellipsoid, 7–9 mm long, 3–4 mm across, 2.2–2.5 times longer than wide, not conspicuously constricted between seeds, circular in transverse section, 3 or 4(rarely 5)-valved; apex acute or rounded; indumentum dense, of mostly stellate and glandular hairs but dendritic-stellate hairs occasionally present, the largest hairs up to 0.8 mm long. Seeds obovoid, c. 2 mm long. **Fig. 6.**

***Selected specimens (from 19 examined)*:** **Western Australia.** FORTESCUE DISTRICT: South Fortescue, Jul 1977, *Pfeiffer* 21 (PERTH); Red Hill Station, Aug 1970, *Beard* 6166 (PERTH); Python Pool, foot of Mt Herbert, Oct 1941, *Gardner* 6287 (PERTH); 16 km WNW of Mt York, Mar 1984, *Newbey* 10002 (PERTH); Nullagine road, S of Mt Edgar Station, Jun 1941, *Burbidge* 1183 (PERTH); Cranks Well on the North West Coastal Highway, Oct 1975, *Weber* 4873 (AD, PERTH); Nanutarra, Ashburton R., May 1905, *Morrison* s.n. [PERTH1525204] (PERTH); Uaroo Station, Jul 1964, *Beard* 3605 (PERTH); 44 km from Duck Creek along the Mt Stewart–Duck Creek track, Jun 1976, *Mitchell* 76/118 (PERTH); 3 mile [c. 5 km] N of Roy Hill, Aug 1963, *Beard* 2801 (PERTH). ASHBURTON DISTRICT: 345 km N of Carnarvon, Jul 1976, *Stacey* 453 (PERTH); Towera Station, Aug 1981, *Cranfield* 1760 (PERTH); c. 15 km NW of Lyndon Homestead, Sep 1975, *Weber* (AD, BRI).

***Distribution and habitat*:** *Corchorus laniflorus* is confined to the Pilbara region, Western Australia, from Lyndon Station eastwards to Mt Edgar Station (**Map 4**). It is recorded as growing on sandy soils on spinifex plains and stony soils on hills or other rocky localities sometimes associated with sandstone.

***Phenology*:** Flowers have been collected in March and from June to October, fruits in June, September and October.

***Notes*:** *Corchorus laniflorus*, *C. parviflorus* and *C. walcottii* all have conspicuous simple glandular hairs present amongst the dense stellate indumentum on the stems, leaves and inflorescences. *Corchorus laniflorus* is most closely related to *C. parviflorus* but differs from that by having generally larger flowers and

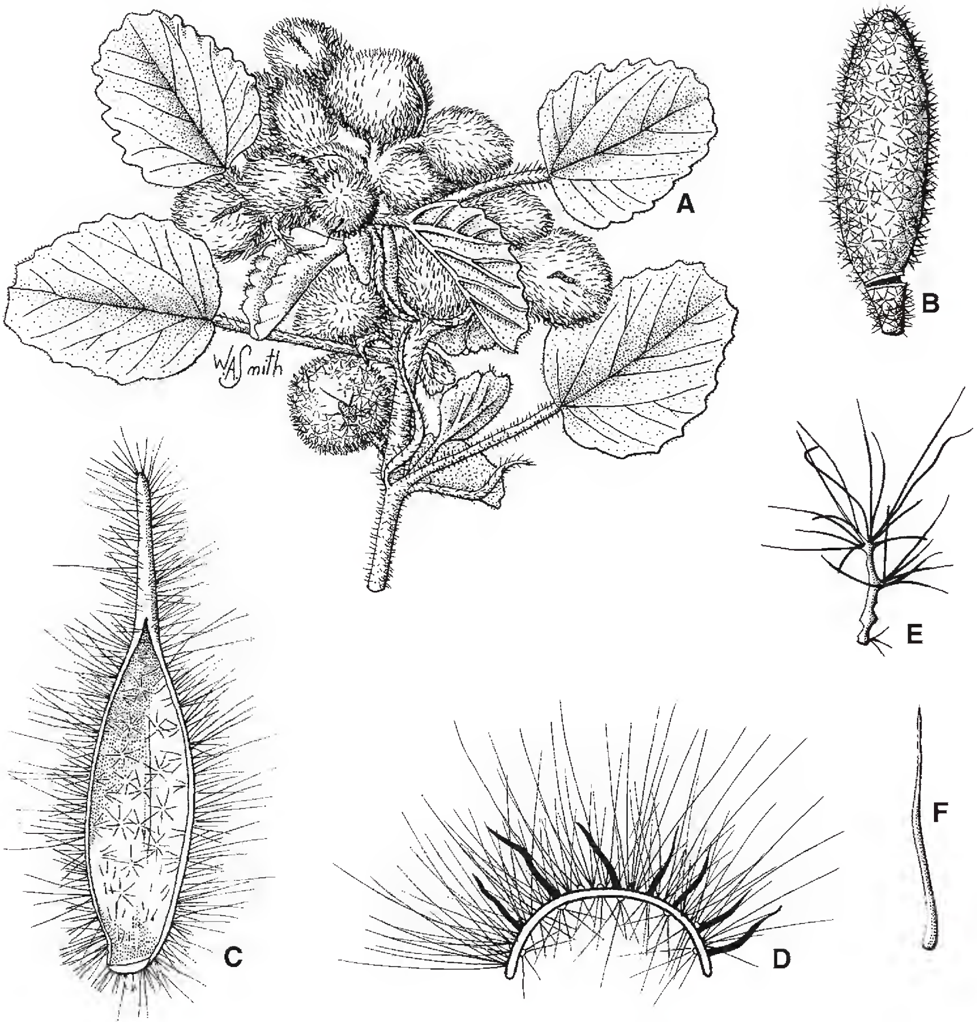

Fig. 6. ***Corchorus laniflorus.*** A. branchlet with flower buds and fruit. × 1. B. fruit with persistent sepals removed. × 3. C. ventral view of sepal. × 6. D. cross-section of sepal. × 12. E. dendritic-stellate hair. × 24. F. simple glandular hair. × 24. A from *Weber* 4873 (AD); B–F from *Gardner* 6287 (PERTH). Del. W. Smith.

fruits, and a thicker and denser indumentum. *Corchorus laniflorus* is distinguishable from *C. walcottii* by having a thicker indumentum on the stems and leaves, persistent sepals that enclose the fruit and shorter hairs on the fruit. *Corchorus laniflorus* resembles *C. sericeus* in having persistent sepals that enclose the fruit, but differs from that in having conspicuous simple glandular hairs, larger flowers and fruits and a thicker and softer indumentum on most parts.

The collections, *Forest* [MEL227128], *Burbidge* 5881 (PERTH), *Burbidge* 5961 (PERTH) and *Mitchell* PRP275 (BRI) from Abydos and Woodstock Stations south of Port Hedland, resemble *C. laniflorus* but differ from the typical form of this species by their smaller flowers, lack of conspicuous simple glandular hairs and narrowly ovate to ovate leaves. These specimens are somewhat similar to *C. sericeus* subsp. *densiflorus* from north-eastern Northern Territory. However, they differ from *C. sericeus* subsp. *densiflorus* in having a denser indumentum and larger flowers. These collections may represent a distinct species but further collections and study are required.

9. Corchorus lasiocarpus Halford **sp. nov.** similis *C. walcottii* et *C. lanifloro* autem ab utroque pilis conspicuis simplicibus glandularibus deficientibus differt et ab illo sepalis angustioribus (1–3 mm latis non 3–5 mm latis) persistentibus in fructibus, pilis longioribus (3 mm longis non 1.5 mm longis) in fructibus et in pagina abaxiali sepalarum et ab hoc fructibus majoribus (8–20 × 5–16 mm non 7–9 × 3–4 mm) differt. **Typus:** Western Australia. FORTESCUE DISTRICT: Hamersley Range near Wittenoom Gorge, 7 May 1958, *N.T. Burbidge* 6005 (holo: PERTH; iso CANB).

Compact to open shrub to 1 m high, sometimes viscid; stems much branched, spreading. Indumentum on young shoots, branchlets, leaves, stipules, peduncles, pedicels and bracts grey-white, moderately dense to dense, comprised of mostly stellate hairs but dendritic-stellate and simple hairs also occasionally present. Stellate hairs sessile or stipitate, up to 2 mm across; stipes red-brown or white, straight or tortuous, up to 0.8 mm long; rays firm to pliable, white, spreading, up to 2 mm long. Dendritic-stellate hairs up to 2.4 mm long; rays firm to pliable, up to 1.5 mm long. Simple hairs glandular, white, flexuous, up to 0.5 mm long. Leaves with petioles 7–25 mm long; stipules subulate-linear; 2–10 mm long; lamina narrowly ovate to ovate or narrowly oblong to oblong, 2–6 cm long, 0.4–3 cm wide, l:w ratio 1.8–3.5:1, concolorous; base rounded; margin serrate to dentate-serrate; apex obtuse to rounded. Inflorescences umbellate, 3–6-flowered, leaf-opposed, solitary at nodes; peduncles 4–25 mm long; pedicels 4–10 mm long, spreading to erect in flower and fruit; bracts filiform-linear, 5–15 mm long. Flower buds ellipsoid, 5–10 mm across; apex obtuse with 5 spreading caudae to 5 mm long. Sepals 5, persistent, narrowly obovate-elliptic, 9–15 mm long, 1–3 mm wide; abaxial surface with a dense indumentum of stellate and dendritic-stellate hairs, the largest hairs up to 3 mm long; adaxial surface stellate-villose proximally, glabrous distally; apex caudate, up to 6 mm long. Petals 5; lamina obovate to broadly obovate, 6–10 mm long, 5–8 mm wide, glabrous; claw 0.7–1 mm long, with ciliate margins. Androgynophore 0.1–0.3 mm long; annulus entire or sometimes sinuate, 0.2–0.4 mm long, glabrous. Stamens 95–140; filaments 4–6 mm long; anthers c. 0.5 mm long. Ovary subglobose or ellipsoid, 1.6–3 mm across, densely stellate-tomentose, 4 or 5(rarely 3)-locular, with 10–24 ovules in each locule; style 3–6 mm long. Fruits narrowly ellipsoid to broadly ovoid-ellipsoid, 8–20 mm long, 5–16 mm across, 1.2–2.5 times longer than wide, not conspicuously constricted between seeds, ± circular in transverse section, 4 or 5(rarely 3)-valved; apex acute to rounded; indumentum dense, of stellate and dendritic-stellate hairs up to 5 mm long. Seeds obovoid, c. 2 mm long.

Affinities: *Corchorus lasiocarpus* resembles *C. walcottii* and *C. laniflorus* but differs from both by lacking conspicuous simple glandular hairs. In addition, *C. lasiocarpus* differs from *C. walcottii* by having narrower sepals (1–3 mm across compared with 3–5 mm across) that are persistent and longer hairs on the abaxial surface of the sepals (3 mm long compared with 1.5 mm long). *Corchorus lasiocarpus* differs from *C. laniflorus* by having larger fruit (8–20 × 5–16 mm compared with 7–9 × 3–4 mm).

Corchorus lasiocarpus can be confused with *C. incanus*. For differences from *C. incanus* refer to ‘Affinities’ section under that species.

Etymology: The specific epithet refers to the woolly appearance of this species fruit; Greek *lasios*, hairy, woolly and *karpos* fruit.

Notes: *Corchorus lasiocarpus* is confined to the north-west of Western Australia. The species as circumscribed here exhibits variation in numerous characters including leaf and fruit size, and the length of dendritic-stellate hairs. Two subspecies are formally recognised here.

Fruits 15–20 mm long; dendritic-stellate hairs on fruit up to 5 mm long
. . . . **9a. C. lasiocarpus** subsp. **lasiocarpus**
Fruits 8–12 mm long; dendritic-stellate hairs on fruit up to 2 mm long
. . . . **9b. C. lasiocarpus** subsp. **parvus**

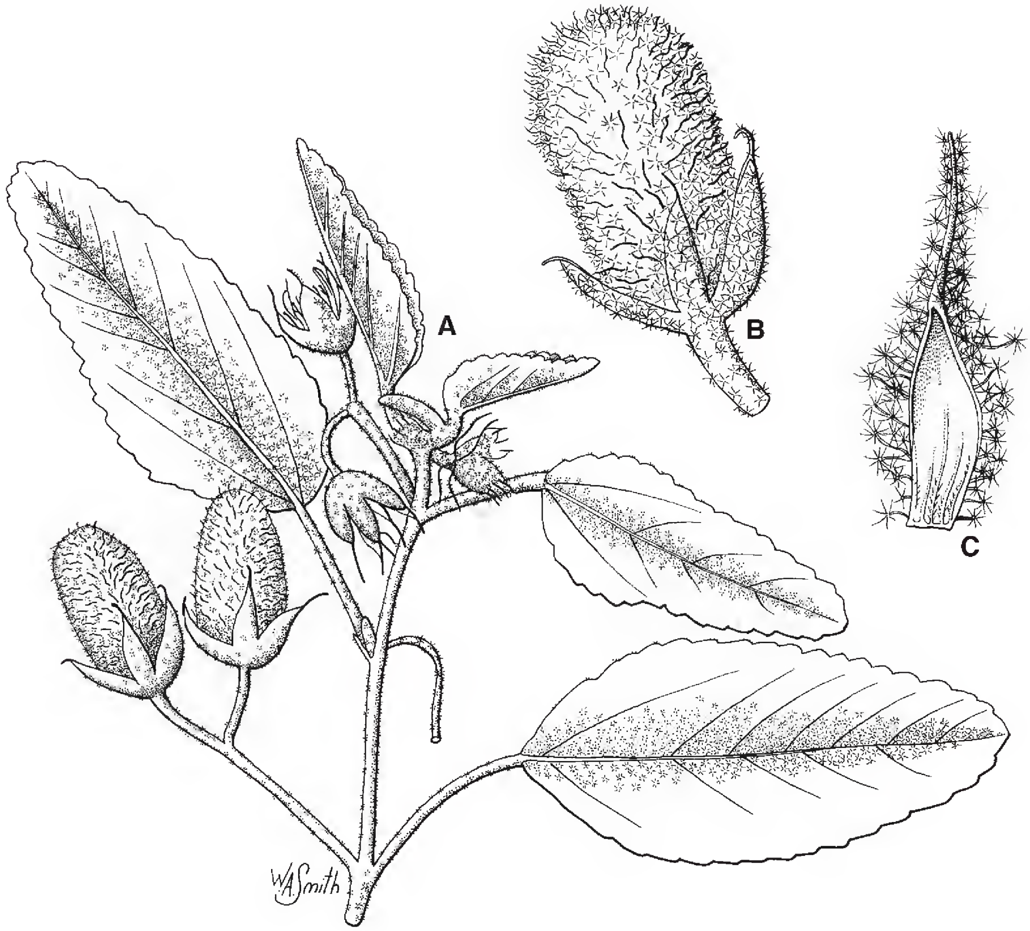

Fig. 7. ***Corchorus lasiocarpus*** subsp. ***lasiocarpus*****.** A. branchlet with fruit. × 1. B. fruit. × 2. C. ventral view of sepal. × 4. A–C from *Royce* 1707 (PERTH). Del. W. Smith.

9a. Corchorus lasiocarpus Halford subsp. lasiocarpus

Spreading shrub to 1 m high. Petioles 10–25 mm long. Leaf lamina narrowly ovate to ovate, 3.5–6 cm long, 1.5–3 cm wide, l:w ratio 1.8–2:1. Inflorescences 3–6-flowered; peduncles 8–25 mm long; pedicels 5–10 mm long. Flower buds 7–10 mm across. Sepals 12–15 mm long, 2–3 mm wide; apex caudate, up to 6 mm long. Petals obovate to broadly obovate, 8–10 mm long, 6–8 mm wide. Stamens 130–140; filaments 5–6 mm long. Ovary subglobose, 2–3 mm across, style 5–6 mm long. Fruits narrowly to broadly ovoid-ellipsoid, 15–20 mm long, 12–16 mm across; dendritic-stellate hairs up to 5 mm long. **Fig. 7.**

Selected specimens (from 20 examined)**: Western Australia.** FORTESCUE DISTRICT: between Woodstock Station and Hamersley Range (Tablelands), May 1958, *Burbidge* 5989 (PERTH); 116 miles [c. 187 km] S of Port Hedland, on Wittenoom road, Aug 1960, *George* 1091 (PERTH); 4 km SW of Two Sisters, c. 145 km SE of Shay Gap, Jul 1984, *Newbey* 10528 (PERTH); 18 km SSW of Two Sisters, c. 160 km SE of Shay Gap, Jul 1984, *Newbey* 10477 (PERTH); 142 miles [c. 228 km] S of Port Hedland, on Wittenoom road, Aug 1960, *George* 1073 (PERTH); 11 miles [c. 18 km] E of Wittenoom, Aug 1960, *George* 1008 (PERTH); Yampire Gorge, Hamersley Range, Aug 1959, *Gardner* 12274 (PERTH); Dale Gorge, Hamersley Range, Aug 1960, *George* 1046 (PERTH); Stag Arrow Creek, Little Sandy Desert, Apr 1979, *Mitchell* 451 (DNA, PERTH); 1 mile [c. 1.6 km] N of Stag Arrow Creek, May 1947, *Royce* 1707 (PERTH); 20 miles [c. 32 km] N [of] Christmas Creek on R.P.F., May 1947, *Royce* 1772 (PERTH); off main road from Paraburdoo to Tom Price, 1 km along pipeline access track, Paraburdoo, Sep 1984, *Wurm* 1496 (PERTH). KEARTLAND DISTRICT: Little Sandy Desert, Apr 1979, *Mitchell* 687 (DNA, PERTH).

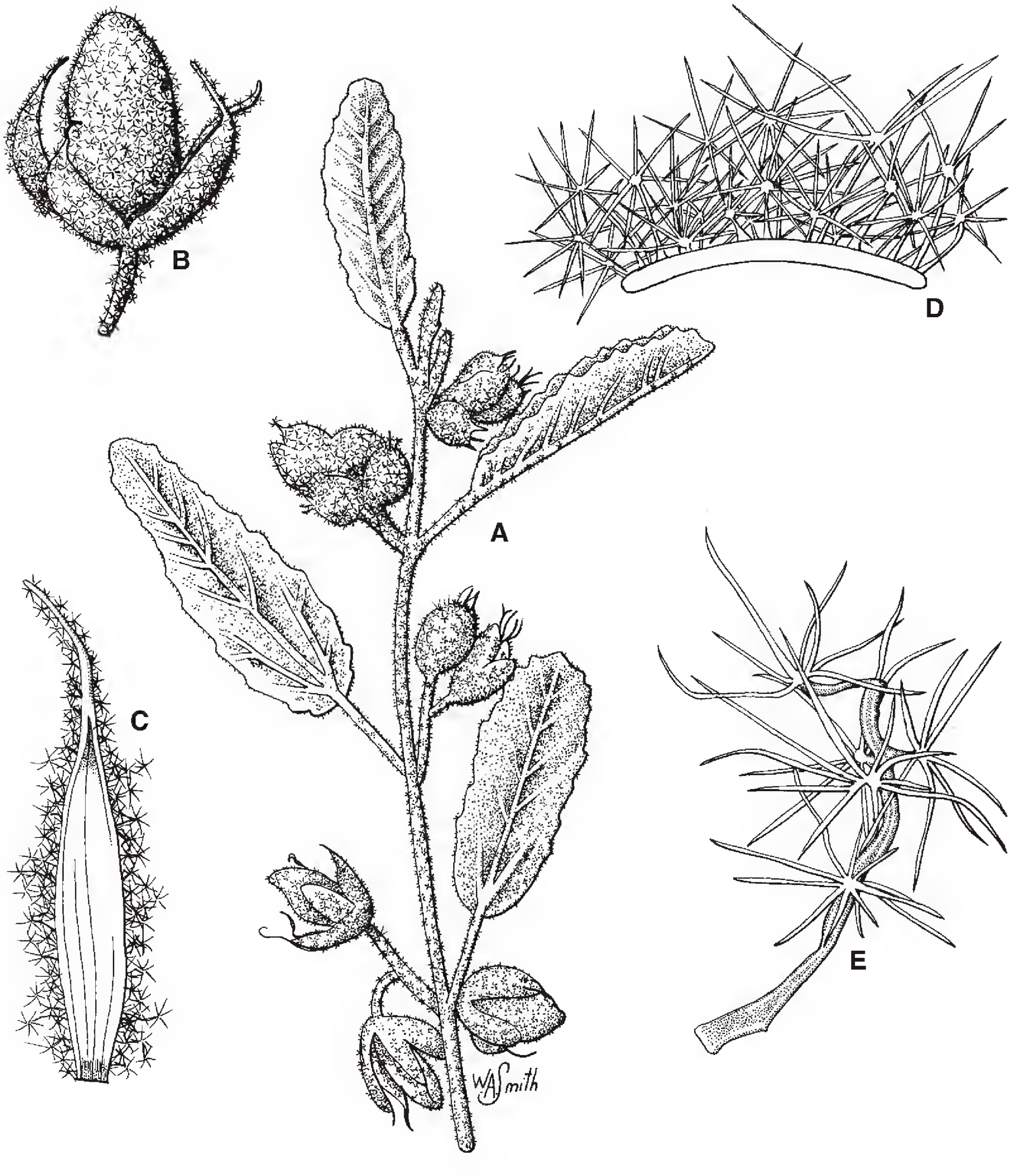

Fig. 8. ***Corchorus lasiocarpus*** subsp. ***parvus.*** A. branchlet with flower buds and fruit. × 1.5. B. fruit. × 3. C. ventral view of sepal. × 6. D. cross-section of sepal. × 24. E. dendritic-stellate hair. × 36. A–E from *Gardner* 6390 (PERTH). Del. W. Smith.

***Distribution and habitat*:** *Corchorus lasiocarpus* subsp. *lasiocarpus* occurs from Tom Price eastwards to the Two Sisters on the western edge of the Great Sandy Desert (**Map 8**). It is recorded as growing in hummock grassland and open shrubland communities, on sandy, stony or gravelly soils along watercourses.

***Phenology*:** Flowers have been collected in April, May, December and from July to September, fruits in April, May, August and December.

9b. Corchorus lasiocarpus subsp. **parvus** Halford **subsp. nov.** a *C. lasiocarpo* subsp. *lasiocarpo* fructibus minoribus (8–12

× 5–7 mm non 15–20 × 12–16 mm), foliis minoribus (2–5.5 × 0.4–2.5 cm non 3.5–6 × 1.5–3 cm) pilis stellato-dendriticis minoribus (usque 2 mm longis non usque 5 mm longis) vestitis distinguendus. **Typus:** Western Australia. FORTESCUE DISTRICT: Yathalla Well, near Mt Rica, Hamersley Range, 22 Oct 1941, *C.A. Gardner* 6390 (holo: PERTH).

Open to compact shrub to 0.8 m high. Petioles 7–15 mm long. Leaf lamina narrowly ovate or narrowly oblong to oblong, 2–5.5 cm long, 0.4–2.5 cm wide, l:w ratio 2.1–3.5:1. Inflorescences 3 or 4-flowered; peduncles 4–17 mm long; pedicels 4–7 mm long. Flower buds 5–8 mm across. Sepals 9–12 mm long, 1–3 mm wide; apex caudate, up to 3 mm long. Petals obovate, 6–8 mm long, 5–6 mm wide. Stamens c. 95; filaments 4–5 mm long. Ovary ellipsoid, 1.6–2 mm across; style 3–5 mm long. Fruits narrowly ellipsoid, 8–12 mm long, 5–7 mm across; dendritic-stellate hairs up to 2 mm long. **Fig. 8.**

***Selected specimens (from 14 examined)*: Western Australia.** FORTESCUE DISTRICT: near Robe R., Aug 1970, *Beard* 6144 (PERTH); Hamersley Range–Bulgeeda to Pyrton, Aug 1963, *Cole* WA5040 (PERTH); Hamersley Range, Aug 1963, *Cole* WA5094 (PERTH); flats E of East Prongs, Tom Price, Jul 1980, [*Atkins*] HI-707 (PERTH); 6 miles [c. 10 km] E of Mt Brockman, Aug 1970, *Demarz* 2467 (PERTH); Marandoo, Mar 1980, *Atkins* HI-659 (PERTH); 0.5 km E of Packsaddle, Feb 1987, *Mollemans* 2279 (AD, PERTH); 2 km W of the Governor on the Packsaddle–West Angeles road, 23 km from P.S., Feb 1987, *Mollemans* 2216 (AD, PERTH).

***Distribution and habitat*:** *Corchorus lasiocarpus* subsp. *parvus* is confined to the Hamersley Range from near Mt Rica south-east to Mt Bruce (**Map 9**). It is recorded as growing in hummock grassland and tree steppe communities, on stony slopes and plains.

***Phenology*:** Flowers have been collected in February, March and from July to October, fruits in March.

***Affinities*:** *Corchorus lasiocarpus* subsp. *parvus* can be distinguished from *C. lasiocarpus* subsp. *lasiocarpus* by its smaller fruit (8–12 × 5–7 mm compared with 15–20 × 12–16 mm), smaller leaves (2–5.5 × 0.4–2.5 cm compared with 3.5–6 × 1.5–3 cm) and shorter dendritic-stellate hairs on the fruit (up to 2 mm long compared with up to 5 mm long).

***Etymology*:** The specific epithet is in reference to the overall smaller dimensions of this subspecies; Latin *parvus* little.

10. Corchorus leptocarpus A.Cunn. ex Benth., Fl. Austral. 1: 278 (1863). **Type:** [Western Australia.] Water Island, NW coast, [Sep 1820,] *A. Cunningham* [No. 247] (holo: K; iso: MEL [MEL227288], CANB).

Shrub to 2 m high; stems sparingly to much branched, erect; young shoots with ferruginous indumentum. Indumentum on branchlets, leaves, stipules, peduncles, pedicels and bracts grey-white, moderately dense to dense, comprised of stellate hairs. Stellate hairs sessile or stipitate, up to 0.4 mm across; stipes red-brown, straight, up to 0.2 mm long; rays firm, white or sometimes ferruginous, up to 0.2 mm long. Leaves with petioles 8–13 mm long; stipules narrowly triangular to subulate-linear, 3–5 mm long; lamina narrowly ovate to ovate, 6–10 cm long, 2–4 cm wide, l:w ratio 2.5–3:1, discolorous; base rounded or slightly cordate; margin serrulate or crenate; apex obtuse or rarely acute. Inflorescences umbellate, 3–6-flowered, leaf-opposed or lateral, solitary at upper nodes; peduncles 1–4 mm long; pedicels 5–7 mm long, spreading to erect in flower, recurved to erect in fruit; bracts subulate-linear, 2–3 mm long. Flower buds obovoid-ellipsoid, 4–5 mm across, longitudinally ridged; apex obtuse with 5 erect to spreading caudae to 2 mm long. Sepals 5, not persistent, narrowly obovate, 12–14 mm long, c. 3 mm wide; abaxial surface with a dense indumentum of stellate hairs up to 0.2 mm long; adaxial surface stellate-pubescent proximally, glabrous distally; apex acuminate-caudate, up to 2 mm long. Petals 5; lamina obovate to broadly obovate, 8–10 mm long, c. 7 mm wide, glabrous; claw c. 1 mm long, stellate-pubescent on margins. Androgynophore c. 0.4 mm long; annulus entire, c. 0.4 mm long, glabrous. Stamens 80–90; filaments 7–9 mm long; anthers c. 0.5 mm long. Ovary cylindrical, c. 0.9 mm across, densely stellate-puberulous, 3(rarely 4)-locular, with 44–48 ovules in each locule; style 6–7 mm long. Fruits subcylindrical, 20–60 mm long, 2–3 mm across, 7–20 times longer than wide, ± straight to slightly curved or if on recurved pedicels then fruit abruptly bent near base so that the fruit is perpendicular with the apex pointing upwards, slightly to markedly constricted between seeds, circular in transverse section, 3(rarely 4)-valved; apex attenuate, 2–4 mm long; indumentum moderately dense to dense, of stellate hairs; stellate hairs up to 0.5 mm long, 0.4 mm across. Seeds compressed obovoid, c. 2 mm long.

Additional specimens**: Western Australia.** GARDNER DISTRICT: 6 km SW of Crystal Head, Port Warrender, Admiralty Gulf, Jan 1982, *Farrell* 979 (PERTH); Boomerang Bay on W side of Bigge Island, Bonaparte Archipelago, May 1987, *Kenneally* 10018 (BRI, PERTH); E side of Mindjau Creek, Port Warrender, Admiralty Gulf, Jan 1982, *Kenneally* 7771 (PERTH); Hunter R., West Kimberley, May 1987, *Kenneally* 9946 (PERTH); Pim Hill, SE of West Bay, May 1984, *Willis* s.n. [MEL1599281] (MEL); Osborne Island (south east island), Bonaparte Archipelago, Jun 1973, *Wilson* 11095 (PERTH).

Distribution and habitat**:** *Corchorus leptocarpus* occurs on the islands and in coastal areas of the Kimberley, Western Australia, from Bigge Island, Bonaparte Archipelago eastwards to West Bay (**Map 6**). It is recorded as growing on soils derived from sandstone, along drainage lines and in shallow depressions in flat country.

Phenology**:** Flowers have been collected in May, fruits in May and June.

Notes**:** *Corchorus leptocarpus* is similar to *C. sidoides* in that it has narrow cylindrical fruits that are slightly to markedly constricted between the seeds. However, *C. leptocarpus* differs from *C. sidoides* by having larger flowers (sepals 12–14 mm long compared with 3–9 mm long; petals c. 10 × 7 mm compared with 2–7 × 0.5–4 mm), larger leaves (6–10 × 2–4 cm compared with 0.6–9 × 0.2–3 cm), and erect rather than spreading to pendulous fruit. *Corchorus leptocarpus* is most closely related to *C. sublatus* and *C. subargentus*. For features distinguishing *C. leptocarpus* from *C. sublatus* and *C. subargentus* see 'Affinities' under those species.

11. Corchorus mitchellensis Halford, **sp. nov.** affinis *C. leptocarpo* autem floribus minoribus (sepalis 6–7 × c. 2 mm et petalis 6 × 3 mm non sepalis 12–14 mm × c. 3 mm et petalis 8–10 x. c. 7 mm), pilis stellatis majoribus (usque 1.3 mm diam. non usque 0.4 mm diam.) in fructibus differt. **Typus:** Western Australia. GARDNER DISTRICT: Mitchell Falls, Mitchell Plateau, 30 May 1992, *D. Halford* Q1433 (holo; PERTH; iso: BRI, DNA, MEL, distribuendi).

Shrub to 1 m high; stems sparingly to much branched, erect; young shoots with ferruginous indumentum. Indumentum on branchlets, leaves, stipules, peduncles, pedicels and bracts grey-white or ferruginous, moderately dense to dense, comprised of stellate hairs. Stellate hairs sessile or stipitate, up to 1.5 mm across; stipes white, straight, c. 0.1 mm long; rays firm, white or ferruginous, up to 0.7 mm long. Leaves with petioles 6–10 mm long; stipules subulate-linear, 1–2 mm long; lamina narrowly ovate to ovate, 3.5–8 cm long, 1–2.5 cm wide, l:w ratio 3.1–3.5:1, discolorous; base rounded; margin serrate to serrulate; apex obtuse to acute. Inflorescences umbellate 3–6-flowered, leaf-opposed, solitary at upper nodes; peduncles 1–2 mm long; pedicels 1–2 mm long, spreading to erect in flower, recurved in fruit; bracts subulate-linear, 1–2 mm long. Flower buds obovoid-ellipsoid, 3–4 mm across; apex obtuse with 5 erect caudae to 0.7 mm long. Sepals 5, not persistent, narrowly obovate, 6–7 mm long, c. 2 mm wide; abaxial surface with a moderately dense to dense indumentum of stellate hairs up to 0.7 mm long; adaxial surface stellate-pubescent proximally, glabrous distally; apex acuminate-caudate, up to 1 mm long. Petals 5; lamina obovate, c. 6 mm long, c. 3 mm wide, glabrous; claw c. 0.8 mm long, stellate-pubescent on margins. Androgynophore c. 0.4 mm long; annulus entire, c. 0.4 mm long, glabrous. Stamens 60–70; filaments 3–4 mm long; anthers c. 0.5 mm long. Ovary cylindrical, c. 0.8 mm across, densely stellate-tomentose, 3-locular, with 20–24 ovules in each locule; style c. 4 mm long. Fruits subcylindrical, 20–40 mm long, 3–4 mm across, 7–10 times longer than wide, curved, circular in transverse section, slightly constricted between seeds, 3-valved; apex acute to obtuse, orientated upward; indumentum dense, of stellate hairs; stellate hairs up to 1 mm long, 1.3 mm across. Seeds compressed obovoid or columnar, 1–3 mm long. **Fig. 9.**

Additional specimens**: Western Australia.** GARDNER DISTRICT: Mitchell Falls, Feb 1980, *Done* 120 (DNA); Mitchell Falls, Mitchell Plateau, May 1992, *Halford* Q1433a (BRI).

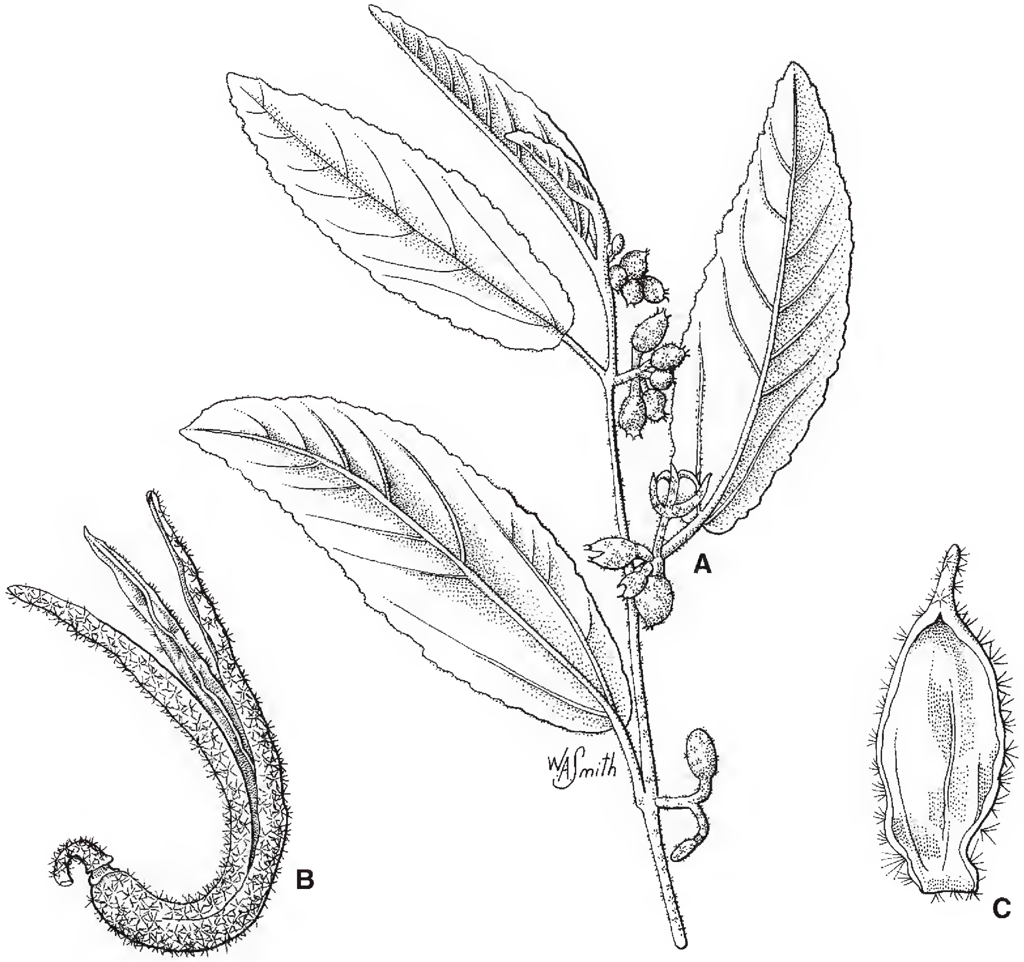

Fig. 9. ***Corchorus mitchellensis.*** A. branchlet with flower buds. × 1.5. B. fruit. × 2. C. ventral view of sepal. × 8. A from *Done* 120 (DNA); B, C from *Halford* Q1443 (BRI). Del. W. Smith.

***Distribution and habitat*:** *Corchorus mitchellensis* is known only from sandstone country around Mitchell Falls, Mitchell Plateau, Kimberley, Western Australia (**Map 4**). It is recorded as growing in shrubland and low open woodland communities on sandy or gravelly soils along drainage lines in dissected sandstone hills.

***Phenology*:** Flowers have been collected in February, fruits in May.

***Affinities*:** *Corchorus mitchellensis* is related to *C. leptocarpus* but differs from that by having smaller flowers (sepals 6–7 × c. 2 mm, petals c. 6 × 3 mm compared with sepals 12–14 × c. 3 mm, petals 8–10 × c. 7 mm) and larger stellate hairs on the fruit (hairs up to 1.3 mm across compared with 0.4 mm for *C. leptocarpus*).

***Etymology*:** The specific epithet is derived from the name Mitchell, plus the suffix *-ensis* indicating place of origin, alluding to the Mitchell Plateau from where this species is known.

12. Corchorus obclavatus Halford, **sp. nov.** quoad collocationem et formam et magnitudinem fructuum *C. pumilionis* autem statura altiore et forma

> magnitudineque foliis differt (vide tabulam 2 pro differentiis). *Corchorus obclavatus* quoad habitus *C. sidoidi* subsp. *rostrisepalo* et *C. sublato* similis autem ab utroque fructibus brevioribus (4–9 mm longis nec 20–55 mm longis in *C. sidoide* subsp. *rostrisepalo* nec 20–50 mm in *C. sublato*), obclavatis non ± cylindricis differt. Addite *C. obclavatus* a *C. sublato* fructibus pendulis non erectis differt. **Typus:** Northern Territory. Darwin and Gulf Region: Jim Jim Falls, Kakadu NP, 20 April 1992, *D. Halford* Q1150 (holo: DNA; iso: BRI, MEL, distribuendi).

Shrub to 2 m high; stems sparingly to much branched, erect; young shoots with ferruginous indumentum. Indumentum on branchlets, leaves, stipules, peduncles, pedicels and bracts, grey-white, dense, comprised of stellate hairs. Stellate hairs sessile or stipitate, up to 0.7 mm across; stipes red-brown, straight, up to 0.2 mm long; rays pliable, white or ferruginous, up to 0.5 mm long. Leaves with petioles 4–15 mm long; stipules subulate-linear, 2–5 mm long; lamina narrowly ovate, 3–9 cm long, 0.7–2 cm wide, l:w ratio 3.6–6:1, discolorous; base rounded or slightly cordate; margin serrulate to crenulate; apex acute or obtuse. Inflorescences umbellate, 4–7-flowered, leaf-opposed, solitary at upper nodes; peduncles 1–2 mm long; pedicels 1–2 mm long, erect to spreading in flower, recurved in fruit; bracts subulate-linear to filiform, 2–3 mm long. Flower buds obovoid-ellipsoid, 2–3 mm across; apex obtuse with 4 spreading caudae to 0.7 mm long. Sepals 4, not persistent, narrowly obovate, 4–6 mm long, 1–2 mm wide; abaxial surface with a dense indumentum of stellate hairs up to 0.3 mm long; adaxial surface glabrous; apex acuminate, up to 0.7 mm long. Petals 4; lamina narrowly obovate, 4–5 mm long, 2–3 mm wide, glabrous; claw c. 0.5 mm long, stellate-pubescent on margins. Androgynophore 0.2–0.3 mm long; annulus entire, c. 0.2 mm long, glabrous. Stamens 20–35; filaments 2–3 mm long; anthers c. 0.4 mm long. Ovary ovoid, 0.5–0.6 mm across, densely stellate-tomentose, 2-locular, with 2–4 ovules in each locule; style c. 3 mm long. Fruits obclavate, 4–9 mm long, 1–2 mm across, 2–5 times longer than wide, pendulous, straight, circular in transverse section, slightly constricted between seeds, 2-valved; apex attenuate, 1–4 mm long; indumentum moderately dense to dense, of stellate hairs up to 0.5 mm long. Seeds compressed obovoid or columnar, 1–2 mm long. **Fig. 10.**

***Aditonal specimens*: Northern Territory.** Darwin and Gulf Region: 12 km E of Mudginberri Homestead, Kakadu NP, Jan 1991, *Russell-Smith* 8409 & *Brock* (BRI); Jim Jim Falls, Kakadu NP, Apr 1992, *Halford* Q1151 (BRI).

***Distribution and habitat*:** *Corchorus obclavatus* is restricted to the sandstone taluses and escarpments of Kakadu National Park, Northern Territory (**Map 1**). It is recorded as growing on sandy soils in open woodland communities near vine thicket margins.

***Phenology*:** Flowers have been collected in January and April, fruits in April.

***Affinities*:** *Corchorus obclavatus* is similar in fruit orientation, shape and size to *C. pumilio* but differs from that by its taller stature, and leaf shape and size. These differences are summarized in **Table 1**. *Corchorus obclavatus* is similar in habit to *C. sidoides* subsp. *rostrisepalus* and *C. sublatus* but can be distinguished from these by having shorter fruit (4–9 mm long compared with 20–55 mm long for *C. sidoides* subsp. *rostrisepalus* and 20–55 mm long for *C. sublatus*) which are obclavate

Table 1. Morphological comparison of *Corchorus obclavatus* and *C. pumilio*.

Character	*C. obclavatus*	*C. pumilio*
habit	erect shrub to 2 m high	spreading shrub to 0.4 m high
leaf shape	narrowly ovate	oblong, oblong-elliptic or narrowly elliptic
leaf size (cm)	3–9 × 0.7–2	0.6–3.5 × 0.4–1.4

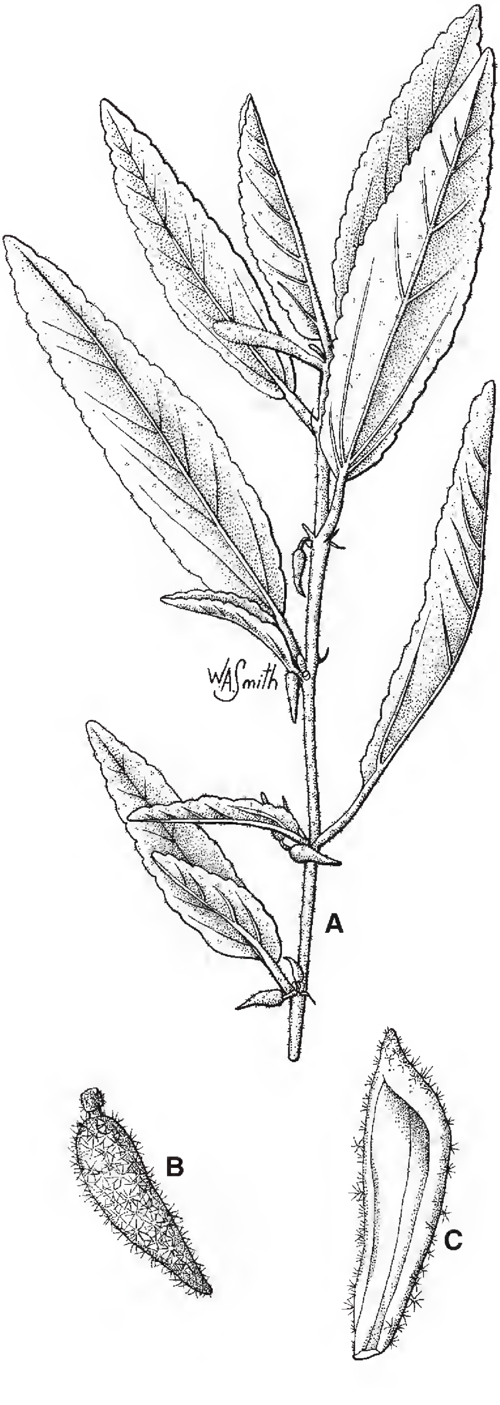

Fig. 10. ***Corchorus obclavatus.*** A. branchlet with fruit. × 1. B. fruit. × 4. C. ventral view of sepal. × 8. A–C from *Halford* Q1150 (BRI). Del. W. Smith.

rather than ± cylindrical. In addition, *C. obclavatus* differs from *C. sublatus* by having pendulous rather than erect fruit.

***Etymology*:** The specific epithet refers to the shape of the mature fruit; Latin *ob-* prefix reversed-, *clavatus* club shape, ie the club-shaped fruit is attached by the thicker end.

13. Corchorus parviflorus (Benth.) Domin, Biblioth. Bot. 89: 383 (1928); *Corchorus parviflorus* (Benth.) Domin var. *parviflorus*, Domin, Biblioth. Bot. 89: 383 (1928); *Corchorus walcottii* var. *parviflorus* Benth., Fl. Austral. 1: 279 (1863). **Type:** [Western Australia.] Nichol Bay, 1862, *F. Gregory*. (lecto: MEL [MEL223669]); isolecto: K *n.v.*, *fide* B. Rye, *Nuytsia* 9(3): 418 (1994); ?isolecto: MEL [MEL1599091]).

Corchorus parviflorus var. *gracilescens* Domin, Biblioth. Bot. 89: 383 (1928). **Type:** [Western Australia.] between the Ashburton and De Gray Rivers, *E. Clement* (syn: K); [Western Australia.] Mons Cupri, Whim Creek, *W.A. Michell* (syn: K).

Corchorus parviflorus var. *ovatus* Domin, Biblioth. Bot. 89: 383 (1928). **Type:** [Western Australia.] between the Ashburton and De Gray Rivers, *E. Clement* (holo: K).

Shrub to 1(–1.6) m high; stems much branched, spreading to erect. Indumentum on young shoots, branchlets, leaves, stipules, peduncles, pedicels and bracts grey-white, moderately dense to dense, comprised of mostly stellate hairs but simple hairs also present. Stellate hairs sessile or sometimes stipitate, up to 1 mm across; stipes red-brown, straight, up to 0.2 mm long; rays soft, white, up to 0.2 mm long. Simple hairs glandular, dull yellow to red-brown, flexuous, up to 1.5 mm long. Leaves with petioles (3–)10–20(–35) mm long; stipules subulate-linear, 6–8 mm long; lamina ovate to broadly ovate or elliptic to broadly elliptic, (1–)1.5–4 cm long, (0.5–)1–3 cm wide, l:w ratio 1.1–2:1, concolorous; base rounded or slightly cordate; margin serrulate; apex obtuse to rounded. Inflorescences umbellate, 3–8-flowered, leaf-opposed, solitary at nodes; peduncles (2–)6–13 mm long; pedicels 2–5 mm long, spreading to erect in flower and fruit; bracts filiform-linear, 3–4 mm long. Flower buds ellipsoid, 3–4 mm across, apex obtuse with 5 spreading caudae to 1 mm long. Sepals 5, persistent, narrowly obovate-elliptic, 4–7 mm long, 1–2 mm wide; abaxial surface with a dense indumentum of stellate and simple hairs, the largest hairs up to 1.5 mm long; adaxial surface stellate-villose proximally, glabrous distally; apex acuminate-caudate, up to 1 mm long. Petals 5; lamina obovate, 3–6 mm long, 2–5 mm wide, glabrous; claw 0.5–0.7 mm long, sparsely stellate-pubescent on margins. Androgynophore 0.2–0.4 mm long; annulus entire, c. 0.2 mm long, glabrous. Stamens 43–73; filaments 2–4 mm long; anthers c. 0.4 mm long. Ovary globose, 1.5–2 mm across, densely stellate-villose, 3 or 4-locular, with 8–10 ovules in each locule; style 3–4 mm long. Fruits subcylindrical, 4–12 mm long, 2–3 mm across, 2–4 times longer than wide, spreading, straight, circular in transverse section, not conspicuously constricted between seeds, 3 or 4-valved; apex attenuate, 1–5 mm long; indumentum dense, of mostly stellate hairs but a few simple hairs also present, largest hairs up to 0.5 mm long. Seeds compressed obovoid, c. 2 mm long. **Fig. 11.**

***Selected specimens (from 17 examined)*: Western Australia.** FORTESCUE DISTRICT: North West Coastal Highway, c.15 km by road WSW of main turnoff to Dampier, Aug 1977, *Jackson* 3033 (AD); Deep Hills runoff gully near Bullgarra Cell, Karratha, Sep 1985, *Glennon* 220 (PERTH); Point Samson, Jul 1981, *Craig* 214 (PERTH); 65 km N of Roebourne, Jul 1976, *Stacey* CIS463 (PERTH); Roebourne, Oct 1941, *Gardner* 6329 (PERTH); 15.8 km N of Talga, Sep 1986, *Chinnock* 6985 (AD); Soda Creek, Black Hills, Eginbah Station, Coongan, Jun 1941, *Burbidge* 998 (PERTH); 38 km NNW of Abydos, Jul–Aug 1987, *Ingleby* HW15 (PERTH); Abydos Station, S of Port Hedland, Sep 1961, *Richardson* 14 (PERTH); Woodstock Station, May 1958, *Burbidge* 5972 (AD, PERTH); c. 160 km S of Port Hedland towards Wittenoom, Apr 1977, *Pullen* 10.911 (CANB); near Marble Bar, Sep 1968, *Blockley* s.n. (PERTH); Mt Edgar, Feb–Mar 1938, *Stewart* 394 (PERTH); Hamersley Range, Aug 1932, *Gardner* s.n. [PERTH1522108] (PERTH)); head of Nullagine R., 54 km S of Nullagine along Great Northern Highway, Jun 1977, *Telford & Butler* 5927 (CANB).

***Distribution and habitat*:** *Corchorus parviflorus* is confined to the Pilbara region, Western Australia, from Karratha eastwards to Mt Edgar Station (**Map 1**). It is recorded as growing in hummock grassland and low open

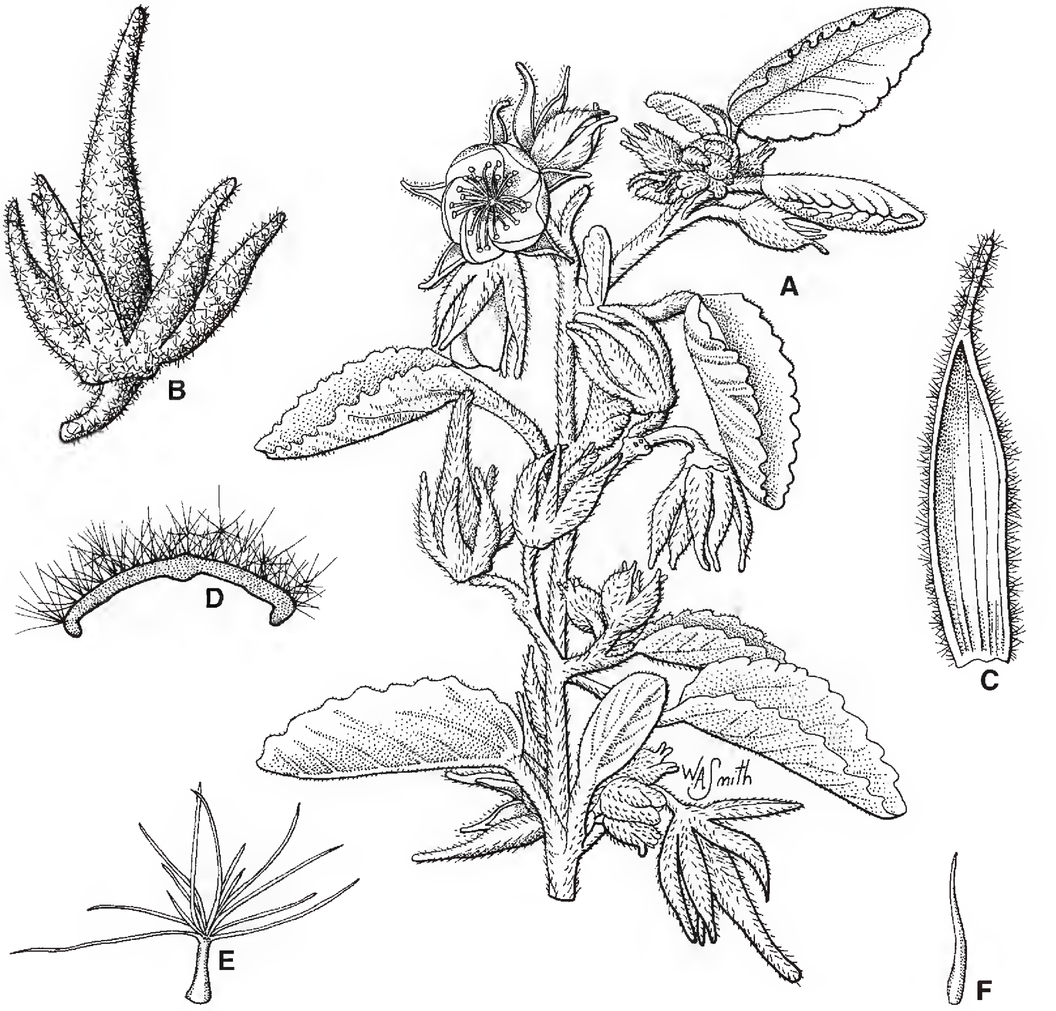

Fig. 11. ***Corchorus parviflorus.*** A. branchlet with flowers and fruit. × 2. B. fruit with persistent sepals. × 4. C. ventral view of sepal. × 8. D. cross-section of sepal. × 24. E. stellate hair. × 48. F. simple glandular hair. × 24. A–F from *Jackson* 3033 (AD). Del. W. Smith.

woodland communities, on stony or sandy soils on hillslopes and plains. It is also recorded occasionally along watercourses.

***Phenology*:** Flowers have been collected from March to October, fruits in April and from August to October.

***Notes*:** *Corchorus parviflorus*, *C. laniflorus* and *C. walcottii* all have conspicuous simple glandular hairs present amongst the dense stellate indumentum on the stems, leaves and inflorescences. *Corchorus parviflorus* is most closely related to *C. laniflorus*. For a discussion on the differences between these species see 'Notes' under *C. laniflorus*. *Corchorus parviflorus* is distinguishable from *C. walcottii* by having persistent sepals and generally smaller leaves, flowers and fruits.

14. Corchorus puberulus Halford **sp. nov.** similis *C. leptocarpo* autem fructibus latioribus (3–4 mm latis non 2–3 mm latis) minus quam 10 plo longioribus quam latis inter semina non constrictis differt. *Corchorus puberulus* floribus ex sepalis 9–15 × 2–3 mm, petalis 9–10 × 4–7 mm filamentis staminalibus 4–6 mm longis, stylo 4–6 mm compositis, pedunculis 5–7 mm longis, foliis 2–5 cm latis praeditus maxime arcte cognatus *C. aulacocarpo* qui ex flores minore, sepalis 6–9 × 1–2 mm, petalis 6–7 × 2–4 mm, stylo 2–4 mm longo compositos, pedunculos breviores 2–3 mm longos, interdum folia angustioria 0.8–2.5 cm lata habet. **Typus:** Western Australia. Fitzgerald District: W end of Cockatoo Island airstrip, W Kimberley, 6 November 1985, *P.J. White* 27 (holo: PERTH).

Shrub to 1.5 m high; stems sparingly to much branched, erect. Indumentum on young shoots, branchlets, stipules, peduncles, pedicels and bracts grey-white, dense, comprised of mostly stellate hairs but with a few dendritic-stellate hairs also present. Stellate hairs sessile or stipitate, up to 0.2 mm across; stipes red-brown, straight, up to 0.2 mm long; rays pliable, white, up to 0.2 mm long. Dendritic-stellate hairs up to 0.3 mm long; stipes red-brown; rays pliable, white, up to 0.2 mm long. Leaves with petioles 7–17 mm long; stipules subulate-linear, 4–5 mm long; lamina ovate, 4.5–10 cm long, 2–5 cm wide, l:w ratio 2–2.9:1, discolorous; adaxial surface sparsely to moderately stellate hairy; abaxial surface moderately to densely stellate hairy; base rounded; margin serrate to serrulate; apex obtuse to acute. Inflorescences umbellate, 3–7-flowered, leaf-opposed or lateral, solitary at upper nodes; peduncles 5–7 mm long; pedicels 5–8 mm long, spreading to erect in flower, recurved to erect in fruit; bracts subulate-linear, 2–3 mm long. Flower buds obovoid-ellipsoid, 4–5 mm across, longitudinally ridged; apex obtuse with 5 erect caudae to 2 mm long. Sepals 5, not persistent, narrowly obovate, 9–15 mm long, 2–3 mm wide; abaxial surface with a dense indumentum of stellate hairs up to 0.3 mm long; adaxial surface stellate-pubescent proximally, glabrous distally; apex caudate, up to 4 mm long. Petals 5; lamina obovate to broadly obovate, 9–10 mm long, 4–7 mm wide, glabrous; claw c. 1 mm long, stellate-pubescent on margins. Androgynophore 0.4–0.7 mm long; annulus entire, c. 0.5 mm long, glabrous. Stamens 60–75; filaments 4–6 mm long; anthers c. 0.5 mm long. Ovary cylindrical, c. 1.5 mm across, densely stellate-puberulous, 4(rarely 3 or 5)-locular, with 40–44 ovules in each locule; style 4–6 mm long. Fruits subcylindrical, 10–30 mm long, 3–4 mm across, 3–8 times longer than wide, erect, straight or slightly curved or if on recurved pedicels then fruit abruptly bent near base so that the fruit is perpendicular with the apex pointing upwards, 4(rarely 3 or 5)-sided, obtusely angled in transverse section, not constricted between seeds, 4(rarely 3 or 5)-valved; apex acute to obtuse; indumentum moderately dense to dense, of stellate hairs; stellate hairs up to 0.3 mm long, 0.2 mm across. Seeds compressed obovoid, c. 2 mm long. **Fig. 12.**

***Additional specimens*: Western Australia.** Gardner District: 5.2 km SE of Mount Lochee, Jun 1987, *Kenneally* 10451 & *Hyland* (PERTH). Fitzgerald District: Koolan Island, near Acacia Ore Body in central part of island, Jun 1985, *Fryxell* 4595 *et al.* (CANB, MEL); Crocodile Creek, Yampi Peninsula, W Kimberley Coast, May 1987, *Kenneally* 10117 (PERTH); Silver Gull Creek at spring, c. 14 km SE of Cockatoo Island, Apr 1983, *Fryxell* & *Craven* 3865 (BRI, CANB, DNA, MEL); 26 km W of Rankin Island, Collier Bay, W Kimberley Coast, Jun 1987, *Kenneally* s.n. & *Hyland* (PERTH)

***Distribution and habitat*:** *Corchorus puberulus* occurs on the islands and in the coastal areas of the Kimberley, Western Australia, from Cockatoo Island, Buccaneer Archipelago eastwards to Mt Lochee (**Map 4**). It is recorded as growing on the edge of vine thickets on soils derived from sandstone and in eucalypt woodland communities along dry creeks.

***Phenology*:** Flowers have been collected in April, fruits in April and June.

***Affinities*:** *Corchorus puberulus* is similar to *C. leptocarpus* but differs from that by having broader fruits (3–4 mm across compared with 2–3 mm across) which are < 10 times as long as wide, trigonous or tetragonous in transverse section and are not constricted between the seeds. *Corchorus puberulus* is most closely related to *C. aulacocarpus* but differs from that by having larger flowers (sepals 9–15 × 2–3 mm, petals 9–10 × 4–7 mm, staminal filaments 4–6 mm long mm long, style 4–6 mm long compared with sepals 6–9 × 1–2 mm, petals 6–7 × 2–4 mm, staminal filaments 3–4 mm long, style 2–4 mm long), longer peduncles (5–7 mm long compared with 2–3 long) and generally broader leaves (2–5 cm wide compared with 0.8–2.5 cm wide).

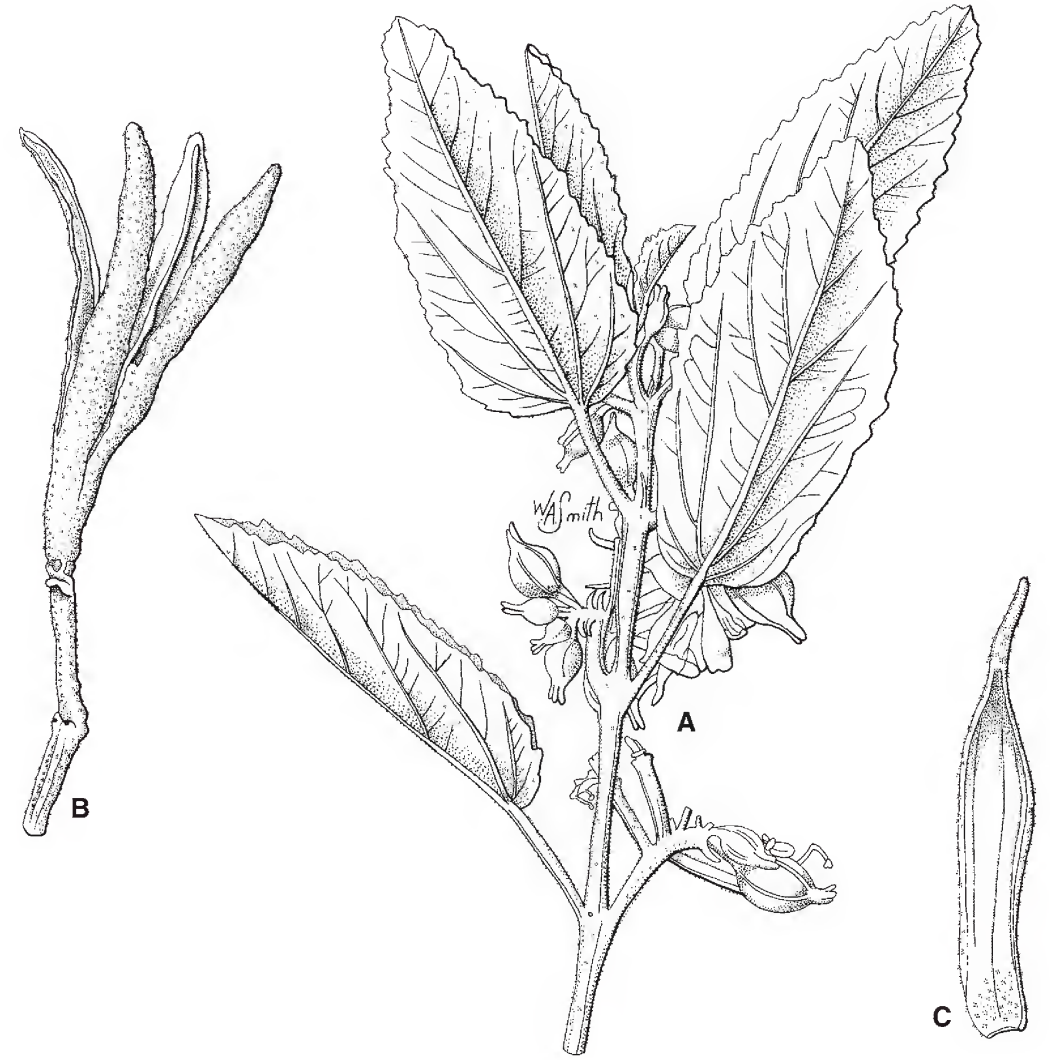

Fig. 12. ***Corchorus puberulus.*** A. branchlet with flowers. × 1.5. B. fruit. × 3. C. ventral view of sepal. × 4. A from *White* 27 (PERTH); B, C from *Fryxell et al.* 4595 (CANB). Del. W. Smith.

***Etymology*:** The epithet alludes to the somewhat dense cover of short, fine, soft hairs on most plant parts; Latin *puberulus* minutely pubescent.

15. Corchorus pumilio R.Br. ex Benth., Fl. Austral. 1: 277 (1863). **Type:** [Northern Territory.] Carpentaria island r[Burney Island] No 32 desc., [19 Jan 1803,] *R. Brown* (lecto, here chosen: K; ?isolecto: BRI, CANB, MEL, NSW).

Shrub to 0.4 m high; stems much branched, spreading; young shoots with greyish white or rarely ferruginous indumentum. Indumentum on branchlets, leaves, stipules, peduncles, pedicels and bracts grey-white, sparse to moderately dense, comprised of stellate hairs. Stellate hairs sessile or stipitate, up to 1.2 mm across; stipes white, straight, up to 0.1 mm long; rays firm, white, up to 1 mm long. Leaves with petioles 1–6(–25) mm long; stipules subulate-linear, 2–5 mm long; lamina oblong,

oblong-elliptic or rarely narrowly elliptic, 0.6–3.5 cm long, 0.4–1.4 cm wide, l:w ratio 1.5–3:1, concolorous; base cuneate to obtuse; margin serrulate to serrate; apex rounded or rarely acute rarely. Inflorescences umbellate, 3–6-flowered, leaf-opposed or lateral, 1 or 2 per node; peduncles c. 1 mm long; pedicels 1–3 mm long, spreading to erect in flower, recurved in fruit; bracts filiform-linear, 1–3 mm long. Flower buds obovoid-ellipsoid, 1–2 mm across; apex acuminate with 4 or 5 erect caudae to 0.5 mm long. Sepals 4 or 5, not persistent, linear to narrowly obovate, 3–6 mm long, 0.5–1 mm wide; abaxial surface with a moderately dense indumentum of stellate hairs up to 0.5 mm long; adaxial surface stellate-pubescent proximally, glabrous distally; apex acuminate, up to 0.5 mm long. Petals 4 or 5; lamina narrowly obovate to obovate, 2–5 mm long, 0.5–2 mm wide, glabrous; claw 0.3–0.5 mm long, stellate-pubescent on adaxial surface and margins. Androgynophore 0.1–0.3 mm long; annulus entire, c. 0.1 mm long, glabrous. Stamens 5–15(–20); filaments 2–4 mm long; anthers c. 0.5 mm long. Ovary cylindrical or subglobose, 0.2–0.4 mm across, densely stellate-tomentose, 2(rarely 3)-locular, with 2–6 ovules in each locule; style 2–3 mm long. Fruits subcylindrical, 3–10(–14) mm long, 1–2 mm across, 1.5–7 times longer than wide, spreading to pendulous, straight, slightly curved or twisted, circular in transverse section, slightly or markedly constricted between seeds, 2(rarely 3)-valved; apex attenuate, 1–2 mm long; indumentum dense, of stellate hairs up to 0.7 mm long. Seeds compressed obovoid, 1–2 mm long.

***Selected specimens (from 58 examined)*:** **Western Australia.** GARDNER DISTRICT: c. 10 km SE of shore of King George R., 5 km W of shore of Timor Sea, Jun 1985, *Fryxell* 4821 *et al.* (CANB, MEL, PERTH); headwaters of Packsaddle Creek, Northern Carr Boyd Ranges, Mar 1978, *Hartley* 14359 (CANB, DNA). FITZGERALD DISTRICT: creek entering an inlet of Talbot Bay, 23 km SE of Cockatoo Island, Apr 1983 *Fryxell & Carven* 3884 (AD, CANB); opposite Bold Bluff along Milliwindi [Milliewindie] track, Leopold Range, Apr 1988, *Cranfield* 6384 (PERTH). DAMPIER DISTRICT: One Arm Point, N Dampier Peninsula, Mar 1989, *Carter* 362 (BRI, DNA, PERTH). CANNING DISTRICT: Godfrey Tank, Southesk Tablelands, Apr 1979, *George* 15452 (AD, DNA, PERTH). **Northern Territory.** DARWIN AND GULF REGION: Roper Bar road, 80 km E of Stuart Highway, Apr 1992, *Halford* Q1090 (BRI); 45 km SSW of Legune Station, Mar 1989, *Russell-Smith* 7561 & *Brock* (DNA); 500 m N of Larrimah, Stuart Highway, Apr 1992, *Halford* Q1196 (BRI); 144 miles [c. 232 km] E of Stuart Highway on Borroloola road, Jun 1971, *Dunlop* 2180 (AD, CANB, DNA, MEL). VICTORIA RIVER REGION: Jasper Gorge, Jul 1974, *Carr* 2833 & *Beauglehole* 46612 (MEL). CENTRAL SOUTHERN REGION: Simpsons Gap NP, Apr 1974, *Latz* 4885 (DNA). **Queensland.** COOK DISTRICT: Fanneys Creek, 86 km W of Georgetown, E of Gilbert R., Apr 1992, *Halford* Q973 (BRI); Turtle Rock area, SE of Laura, Jan 1993, *Bean* 5503 & *Forster* (BRI). BURKE DISTRICT: Settlement Creek, Feb 1923, *Brass* 257 (BRI, CANB); c. 35 km W of Cloncurry on Cloncurry–Mt Isa road, Mar 1977, *Schmid* AS179 (BRI); 20 km S of Mt Isa on road to Boulia, Jun 1991, *Halford* Q454 (BRI). NORTH KENNEDY DISTRICT: Marble Creek mesa, SE of Greenvale, Apr 1991, *Bean* 2940 (BRI). SOUTH KENNEDY DISTRICT: slopes of Mt Hope, Apr 1992, *Thompson & Simon* BUC446 (AD, BRI, DNA, NSW).

***Distribution and habitat*:** *Corchorus pumilio* is widespread across northern Australia from the Kimberley, Western Australia to north-eastern Queensland (**Map 2**). It is recorded as growing in open woodland and hummock grassland communities, on shallow rocky, stony or sandy soils, on hills, ridges and rocky outcrops.

***Phenology*:** Flowers and fruits have been collected from February to August and in November.

***Typification*:** In the protologue of *Corchorus pumilio*, Bentham (1863) cited two collections "islands of the Gulf of Carpentaria, R. Brown" and "Upper Victoria River , F. Mueller". Seven sheets of probable type material of *Corchorus pumilio* have been located. Six sheets of the R. Brown collections have been located (two from K and one each at BRI CANB, MEL, NSW) and one sheet of the F. Mueller collection "Tableland between the Victoria River and Sturts Creek, Feb 1856" located at K with the name *C. pumilio* in red pencil in Bentham's hand. The sheet at Kew of R. Brown's collection labelled "Corchorus No. 32 desc. Carpentaria island r" is chosen here as lectotype, because it is part of the original material and has mature fruit. Whether the other R. Brown sheets (MEL, BRI, CANB, K, NSW) are all from the same collection as the lectotype or separate collections has not been ascertained.

***Notes*:** *Corchorus pumilio* is confused with *C. sidoides* but is distinguished from that by having shorter fruit, smaller flowers, generally fewer stamens in each flower and a sparser indumentum on the leaves and stems.

The typical widespread form of *C. pumilio* is a slender herbaceous shrub, generally green in appearance with a sparse to moderately dense, coarse white indumentum on all parts. The collections *Carr* 3784 & *Beauglehole* 47562 (PERTH)(Geikie Gorge NP) and *Hartley* 14344 (CANB, DNA, PERTH)(Carr Boyd Ranges) from the Kimberley, Western Australia have a more robust habit than the typical form of *C. pumilio* and have a ferruginous indumentum on the young shoots. These collections may represent a distinct species but further collections and study are required.

16. Corchorus sericeus Ewart & O.B.Davies, Fl. N. Terr. 178 (1918). **Type:** Northern Territory. DARWIN AND GULF REGION: Borroloola, 9 Oct 1911, *G. F. Hill* (holo: MEL [MEL223676]; iso: DNA, NSW).

Spindly or compact shrub to 1.5 m high; stems sparingly to much branched, spreading to erect. Indumentum on young shoots, branchlets, leaves, stipules, peduncles, pedicels and bracts grey-white, moderately dense to dense, comprised of mostly stellate hairs but dendritic-stellate and simple hairs also present. Stellate hairs sessile or stipitate, up to 1.2 mm across; stipes red-brown or white, straight or tortuous, up to 0.2 mm long; rays soft to pliable, white or rarely ferruginous, up to 0.6 mm long. Dendritic-stellate hairs up to 1.5 mm long; stipes white or red-brown, tortuous; rays pliable, white, up to 0.6 mm long. Simple hairs glandular, white, flexuous, up to 0.2 mm long. Leaves with petioles 4–15(–20) mm long; stipules subulate-linear, 2–10 mm long; lamina narrowly to broadly ovate or elliptic-ovate, 1.5–7.5 cm long, 0.6–3 cm wide, l:w ratio 2–3:1, discolorous or concolorous; base obtuse to rounded or rarely cordate; margin serrulate; apex acute to rounded. Inflorescences umbellate or racemose, 3–10-flowered, leaf-opposed, solitary at upper nodes; peduncles 1–10 mm long; pedicels 1–7 mm long, spreading to erect in flower and fruit; bracts subulate-linear, 2–10 mm long. Flower buds ellipsoid, 2–5 mm across; apex obtuse with 5 spreading caudae to 5 mm long. Sepals 5, persistent, narrowly obovate-elliptic, 4–14 mm long, 1–3 mm wide; abaxial surface with a dense indumentum of stellate and dendritic-stellate hairs, the largest hairs up to 1 mm long; adaxial surface villose proximally, glabrous distally; apex caudate, up to 5 mm long. Petals 5; lamina obovate, 3–7 mm long, 1–5 mm wide, glabrous; claw 0.4–1 mm long, sparsely pubescent. Androgynophore 0.1–0.3 mm long; annulus entire, 0.2–0.4 mm long, glabrous. Stamens 25–80; filaments 2–5 mm long; anthers c. 0.3. Ovary globose, 0.7–2 mm across, densely stellate-tomentose, 3(rarely 4)-locular, with 2–8 ovules in each locule; style 2–5 mm long. Fruits globose, 2–4 mm across, circular in transverse section, not constricted between seeds, 3(rarely 4)-valved; apex rounded rarely obtuse; indumentum dense of stellate hairs up to 0.7 mm long. Seeds compressed obovoid, c. 2 mm long.

Notes**:** *Corchorus sericeus* is most closely related to *C. laniflorus* but differs from that in having smaller flowers and fruits, and generally shorter and coarser indumentum on most parts.

Corchorus sericeus as recognised here, occurs from the Devils Marbles, Northern Territory eastwards to Georgetown, Queensland. Two subspecies are recognised and can be distinguished using the following key.

Spindly shrubs to 1.5 m high; stems erect; primary stem unbranched for at least 10 to 20 cm above ground level; inflorescences racemose, 7–10-flowered; peduncles 4–15 mm long .... **16a. C. sericeus** subsp. **sericeus**

Open to compact shrubs to 1 m high; stems spreading; primary stem branched at ground level; inflorescences umbellate, up to 5-flowered; peduncles up to 2 mm long .... **16b. C. sericeus** subsp. **densiflorus**

16a. Corchorus sericeus Ewart & O.B.Davies subsp. **sericeus**

Erect spindly shrub up to 1.5 m high. Primary stem unbranched for at least 10 to 20 cm above ground level. Leaves narrowly to broadly ovate, acute to obtuse at apex. Inflorescences racemose, 7–10-flowered; peduncles 4–15 mm long. Indumentum on abaxial surface of sepals comprised of mostly stellate hairs.

***Selected specimens (from 23 examined)*:** **Northern Territory.** Darwin and Gulf Region: White Islet, May 1977, *McKey* 181 (AD, DNA, MEL); 2 km East Lake Eames, Vanderlin Island, Sir Edward Pellew Group, Jul 1988, *Thomson* 2489 (BRI); Favenc Range, c. 160 km from Borroloola on the road to Daly Waters, May 1974, *Pullen* 9316 (CANB, DNA); near McArthur R., May 1947, *Blake* 17762 (BRI, MEL). Barkly Tablelands Region: Kilgour Gorge, Mallapunyah Station, May 1984, *Thomson* 629 (DNA); 30 miles [c. 48 km] S of McArthur River Station, Jul 1948, *Perry* 1692 (CANB, DNA, MEL); 4 miles [c. 6 km] N of Wollogorang Station, Jun 1948, *Perry* 1175 (BRI, CANB, DNA); Wollogorang Station, Jun 1974, *Henshall* 423 (CANB, DNA); 15 km SW of Calvert Hills Station, on road to Barkly Highway, Jun 1991, *Halford* Q585 (BRI). **Queensland.** Burke District: Buchanan Creek W of "Westmoreland" near the Queensland/Northern Territory border, May 1974, *Pullen* 9206 (BRI, CANB, DNA); 3 miles [c. 5 km] W of Westmoreland Station, Jun 1948, *Perry* 1350 (CANB, DNA).

***Distribution and habitat*:** *Corchorus sericeus* subsp. *sericeus* occurs in the subcoastal areas around the Gulf of Carpentaria from Favenc Range, Northern Territory to Westmoreland Station in north-west Queensland (**Map 8**). It is recorded as growing in open woodland communities, on shallow sandy or gravelly soils on sandstone or quartzite ridges. It is also recorded on alluvial loams along watercourses.

***Phenology*:** Flowers have been collected from April to July, fruits from April to June.

***Notes*:** The collection *Craven* 3911 (BRI, CANB, DNA) from the MacArthur River area, Northern Territory has atypically long racemose inflorescences and the whole plant is generally more hairy than in the typical form of *C. sericeus* subsp. *sericeus.*

16b. Corchorus sericeus subsp. **densiflorus** (Benth.) Halford **comb. nov. & stat. nov.**

Corchorus walcottii var. *densiflorus* Benth, Fl. Austral. 1: 279 (1863), 'densiflora'. **Type:** Gulf of Carpentaria, [without date,] *F. Mueller* (lecto, here chosen: K (left hand element); isolecto: MEL [MEL227034]).

Open to compact shrub to 1 m high. Primary stem branched at ground level. Leaves narrowly ovate to ovate or elliptic-ovate, obtuse to rounded rarely acute at apex. Inflorescences umbellate, up to 5-flowered; peduncles up to 2 mm long. Indumentum on abaxial surface of sepals comprised of stellate and dendritic-stellate hairs.

***Selected specimens (from 47 examined)*:** **Northern Territory.** Darwin and Gulf Region: Upper Wearyan R., Jan 1989, *Russell-Smith* 7004 & *Lucas* (DNA). Barkly Tablelands Region: 4 km S [of] Spear Waterhole, Wollogorang, Jan 1989, *Russell-Smith* 6851 & *Lucas* (DNA); 4 km W of No. 16 Bore, Benmara Station, May 1984, *Strong* 160 (DNA); 3 km N of No. 19 Bore, Benmara Station, May 1984, *Low* 17 (DNA); 10 miles [c. 16 km] NE of Alexandria Station, Jun 1948, *Perry* 1487 (AD, BRI, CANB, DNA, MEL, PERTH); 69 km N of Tennant Creek on Stuart Highway, Jun 1991, *Halford* Q537 (BRI); Gibsons Creek, 35 miles [c. 56 km] N of Tennant Creek, Jul 1968, *Must* 195 (AD, BRI, CANB, MEL). Central Northern Region: Devils Marbles, Mar 1955, *Chippendale* 937 (BRI, DNA). **Queensland.** Cook District: Blue Hills, "Mount Surprise", 49 km from Mount Surprise township, Mar 1988, *Champion* 350 (BRI); on Gulf Development Road, near bridge, 1 km E of Georgetown, Apr 1990, *Batianoff* 900402a & *Smith* (BRI). Burke District: Lawn Hill NP, "Island Stack", Jul 1985, *Williams* 85070 (BRI); Bang Bang Jumpup to N of Donors Hill, Apr 1974, *Pullen* 8911 (BRI, CANB, DNA); 28.5 km from Mary Kathleen–Barkly Highway junction on traverse to Mt MacNamara, May 1975, *Catt* & *Cole* 9221 (BRI, CANB); Cloncurry, Aug 1930, *Blake* 12649 (BRI); 5 km N of Barkly Highway on road to Lake Julius, Jun 1991, *Halford* Q511 (BRI); 3 miles [c. 5 km] SE of Cloncurry township, Mar 1954, *Lazarides* 4411 (BRI, CANB, DNA, MEL, PERTH).

***Distribution and habitat*:** *Corchorus sericeus* subsp. *densiflorus* occurs from the Devils Marbles, Northern Territory eastwards to Georgetown, Queensland and from Sir Edward Pellew Group, Northern Territory southwards to Burnham Station, Queensland (**Map 9**). It is recorded as growing in shrubland and open woodland communities, mostly on shallow sandy or stony soils, on rocky hills or plains but also rarely on heavy alluvial soils along drainage lines.

***Phenology*:** Flowers have been collected from January to November, fruits from March to July.

***Notes*:** The distinguishing characters of this subspecies are indicated in the key above.

The size of flowers and leaves, and the thickness of indumentum on the abaxial surface of the sepals varies greatly in this subspecies as circumscribed here. The variation appears to be continuous with no clear gaps that would allow the subdivision of this taxon based on any of these characters.

17. Corchorus sidoides F.Muell., Fragm. 3: 9 (1862). **Type:** [Northern Territory.] Victoria River, May 1856, *F. Mueller* (lecto, here chosen: MEL [MEL220812]).

Shrub to 1.5 m high; stems much branched, procumbent to erect; young shoots with grey-white or ferruginous indumentum. Indumentum on branchlets, leaves, stipules, peduncles, pedicels, and bracts grey-white, moderately dense to very dense or rarely sparse, comprised of stellate hairs. Stellate hairs sessile or stipitate, up to 1.8 mm across; stipes white or ferruginous, straight, up to 0.3 mm long; rays firm to pliable, white or ferruginous, up to 1 mm long. Leaves with petioles 1–20 mm long; stipules subulate-linear, 1–8 mm long; lamina narrowly oblong, oblong-elliptic, narrowly elliptic, ovate-elliptic, narrowly ovate to ovate or narrowly obovate, 0.6–9 cm long, 0.2–3 cm wide, l:w ratio 2–3.5:1, concolorous or discolorous; base obtuse, rounded or attenuate; margin dentate-serrate or serrate to serrulate; apex acute to rounded. Inflorescences umbellate, 4–7-flowered, leaf-opposed or lateral, solitary at upper nodes; peduncles 0.5–5 mm long; pedicels 1–5 mm long, spreading to erect in flower, recurved in fruit; bracts subulate-linear to filiform-linear; 0.7–3 mm long. Flower buds obovoid to obovoid-ellipsoid, 1–3 mm across, sometimes longitudinally ridged; apex obtuse to acuminate-caudate with 4 or 5 erect caudae to 1 mm long. Sepals 5(rarely 4), not persistent, narrowly obovate, 3–9 mm long, 1–2 mm wide; abaxial surface with a moderately dense to very dense indumentum of stellate hairs up to 0.5 mm long; adaxial surface glabrous or stellate-puberulous to stellate-villose proximally; apex acute or acuminate-caudate, up to 1.5 mm long. Petals 5, rarely 4; lamina narrowly obovate to obovate, 2–7 mm long, 0.5–4 mm wide, glabrous; claw 0.5–0.8 mm long, stellate-pubescent on margins. Androgynophore 0.1–0.4 mm long; annulus entire or sinuate, 0.1–0.4 mm long, glabrous. Stamens (16–)20–50; filaments 2–5 mm long; anthers 0.3–0.5 mm long. Ovary cylindrical, 0.5–1 mm across, densely stellate-puberulous or densely stellate-villose, 2 or 3-locular, with 6–24 ovules in each locule; style 1–4 mm long. Fruits subcylindrical (5–)18–60 mm long, 1–3 mm across, mostly 6–20 times longer than wide, spreading or pendulous, straight, curved or very much twisted, circular in transverse section, slightly or markedly constricted between seeds, 2 or 3-valved; apex attenuate up to 4 mm long, orientated downward; indumentum moderately dense to dense, of stellate hairs up to 1 mm long. Seeds compressed obovoid, 1.5–3 mm long. Chromosome n = 6, 8 and 7; 2n = 14 (Basak 1958).

***Typification*:** In the protologue of *Corchorus sidoides*, Mueller (1862) did not cite any particular collection but stated “In locis sterilioribus secus flumen Victoriae frequens” [frequent in barren places along the Victoria River]. Three sheets [MEL220811, MEL220812, MEL227306] on loan to BRI from MEL have been located that are labelled *C. sidoides* and have Mueller as the collector with the locality of collection as Victoria River. The collection of this material would have occurred during the Gregory expedition (1855–1857) to northern Australia and predates the publication of the name *C. sidoides*. The MEL sheet marked MEL220812 is selected as lectotype of the name *Corchorus sidoides* F.Muell. as it agrees with the protologue and is the more complete collection.

***Notes*:** *Corchorus sidoides* is the most widespread and common *Corchorus* species across northern Australia. It is characterised by having generally a spreading habit, relatively long pendulous subcylindrical fruits, a stellate indumentum on the fruit, sepals that are not persistent and leaves that are mostly oblong, oblong-elliptic or ovate-elliptic in outline. It is most closely related to *C. carnarvonensis*, C.*congener*, *C. pumilio* and *C. tomentellus*. For differences from these species refer to ‘Affinities’ and ‘Notes’ under each species.

Corchorus sidoides is morphologically variable, particularly in degree of fruit distortion, shape and size of leaves and size of stellate hairs. The types of both *C. vermicularis* and *C. rostrisepalus* fall within the variation of *C. sidoides* as circumscribed here. The extreme forms within this species differ considerably, but due to the difficulty in assigning material to one or other forms I have used the rank of subspecies to recognise these forms rather than maintaining the previously recognised species. Three subspecies are recognised and can be distinguished using the following key.

1. Stems erect; indumentum on young shoots and buds ferruginous; hairs fine, < 0.4 mm across; leaves narrowly ovate or narrowly elliptic, 3.5–9 cm long, 1.5–3 cm wide; fruits straight or slightly curved, prominently constricted between seeds. .... **17c. C. sidoides** subsp. **rostrisepalus**
Stems procumbent or spreading horizontally or if erect then other characters not as above 2

2. Fruits 2-valved rarely 3-valved, dark purplish-red rarely brown, 1–1.5 mm across, weakly or strongly twisted; leaf laminae narrowly oblong or narrowly oblong-elliptic rarely narrowly obovate, 0.6–3.5(–4) cm long, 0.2–1(–1.5) cm wide; stellate hairs white, up to 0.5 mm across. .... **17b. C. sidoides** subsp. **vermicularis**
Fruits mostly 3-valved occasionally 2-valved, pale-green to brown, 1–2.5 mm across, straight, curved or weakly twisted; leaf laminae ovate-elliptic or narrowly ovate to ovate, occasionally narrowly oblong-elliptic or narrowly oblong, 2–6 cm long, 0.8–2.5 cm wide; stellate hairs white or ferruginous, up to 2 mm across. .... **17a. C. sidoides** subsp. **sidoides**

17a. **Corchorus sidoides** F.Muell. subsp. **sidoides**

Compact shrub to 0.9 m high; stems much branched, spreading, rarely erect. Indumentum on young shoots and buds grey-white. Stellate hairs up to 2 mm across, sessile or stalked; stalks white or ferruginous, up to 0.3 mm long; rays white, up to 1 mm long, pliable to stiff. Leaves with petioles (2–)4–20 mm long; lamina narrowly oblong-elliptic, ovate-elliptic, narrowly ovate to ovate or narrowly obovate, 2–6 cm long, 0.8–2.5 cm wide, concolorous or discolorous; adaxial and abaxial surfaces moderately dense to very dense stellate hairy; base rounded; margin serrate; apex acute to obtuse or rounded. Flower buds obovoid, 2–3 mm across; apex acute with 5 erect caudae to 0.5 mm long. Sepals 5, narrowly obovate, (3–)4–8(–9) mm long, 1–2 mm wide; apex acute or acuminate-caudate, 0.5–1.5 mm long; abaxial surface with moderately dense to very dense indumentum of stellate hairs up to 0.5 mm long; adaxial surface glabrous or stellate-villose proximally. Stamens (16–)20–50. Fruits (5–)18–60 mm long, 1–3 mm across, pale-green to brown, straight, curved or rarely weakly twisted, weakly to strongly constricted between the seeds, 3(occasionally 2)-valved; apex attenuate up to 3 mm long; indumentum moderately dense to dense, of stellate hairs up to 0.5 mm long. Chromosome No. 2n = 14 (Datta *et al.* 1966)

***Selected specimens (from 167 examined)*: Western Australia.** Gardner District: Ivanhoe Station, Ord R., Jun 1944, *Gardner* 7409 (PERTH). Dampier District: Gogo, May 1951, *Gardner* 10254 (PERTH). Fitzgerald District: Sandy River Gorge, Leopold Gorge, Apr 1988, *Cranfield* 6570 (PERTH). Fortescue District. 19.9 km S of Wittenoom turnoff on the Great Northern Highway, Sep 1986, *Chinnock* 7015 (AD); 9 km SW of Mt Cecelia, c. 90 km SE of Shay Gap, Jul 1984, *Newbey* 10553 (CANB, PERTH). Canning District: Little Sandy Desert, May 1979, *Mitchell* 921 (AD, DNA); head of Breaden Valley, Southesk Tablelands, Apr 1979, *George* 15504 (DNA, PERTH). Keartland District: Rudall R. area, Aug 1971, *Wilson* 10585 (MEL, PERTH). Carnegie District: 39 miles [c. 63 km] W of Jupiter Well, Jul 1967, *George* 9087 (PERTH). **Northern Territory.** Darwin and Gulf Region: c. 2 km S of Larrimah on Stuart Highway, May 1985, *Fryxell* 4429 *et al.* (DNA, MEL). Victoria River Region: Bullita Station, Gregory NP, Feb 1986, *Wightman* 2565 & *Clark* (DNA); Pinkerton Range, Mar 1989, *Dunlop* 8121 & *Leach* (DNA, MEL); 20.8 miles [c. 33 km] W [of] Inverway, May 1959, *Chippendale* 5945 (CANB, DNA, PERTH). Central Northern Region: Native Gap, 71 miles [c. 114 km] N of Alice Springs, Jan 1969, *Nelson* 1828 (AD, BRI, DNA, MEL). Central Southern Region: 8 miles [c. 13 km] SE of Aileron, Mar 1955, *Winkworth* 863 (MEL); Harts Range, 10 km S of Harts Range Police Station, Oct 1977, *Noble* 21 (CANB); base of breakaway – upper talus slope, Ruby Gap, Jul 1982 *Purdie* 2386 (CANB); Stokes Creek, Oct 1981, *Latz* 8916 (DNA). **Queensland.** Burke District: 10 km SW of Mt Isa on the road to Dajarra, Jun 1991, *Halford* Q520 (BRI). Gregory North District: Warlus VI, Site R13, Mt Datson (ENE of Boulia), Sep 1977, *Purdie* 1026 (BRI).

***Distribution and habitat*:** *Corchorus sidoides* subsp. *sidoides* is widespread across northern Australia from the Pilbara, Western Australia through the Northern Territory to north-western Queensland (**Map 3**). It is recorded as growing in hummock grassland, open woodland and open forest communities, on sandy, loamy, gravelly or clay soils, on sand dunes, plains and hills.

***Phenology*:** Flowers and fruits have been collected throughout the year.

***Notes*:** A number of collections from around the Arnhem Land escarpment (eg. *Martensz & Schodde* AE701 (BRI, CANB, MEL), *Dunlop* 4571 (DNA), *Telford & Wrigley* 7589 (CANB), *Wightman* 1382 *& Craven* (BRI) and *Halford* Q1116 (BRI)) have shorter fruit than typical (5–10 mm long) and a ferruginous indumentum on the young shoots and flower buds.

The collections from near Kununurra (*Pullen* 10.879 (CANB) and *Mackenzie* 710209-6 (CANB) are typical in leaf size and indumentum but have shorter fruit than typically found in the species.

The collection *Pullen* 10.764 (BRI, CANB) has a fairly erect habit to 1.5 m high with the lower stem free of branches and has generally smaller flowers and fruits than typical, growing on red earths in shrub-grassland.

Further collection and fieldwork may show that a number of these entities warrant formal recognition at specific or subspecific rank.

17b. Corchorus sidoides subsp. vermicularis (F.Muell.) Halford comb. nov. & stat. nov.

Corchorus vermicularis F.Muell., Fragm. 3: 10 (1862). **Type:** [Western Australia/ Northern Territory.] Head of Sturts Creek, Feb 1856, *F. Mueller* (holo: MEL [MEL220810]).

Scorpia simplicifolia Ewart & A.H.K.Petrie, Proceedings of the Royal Society of Victoria ser. 2, 38 (1926). **Type:** Northern Territory. Wycliffe, June 1924, *A.J. Ewart* (holo: MEL [MEL227302]).

Diffuse shrub to 0.5 m high; stems much branched, spreading. Indumentum on young shoots and buds grey-white. Stellate hairs up to 0.5 mm across, sessile or stalked; stalk white or reddish-brown, up to 0.1 mm long; rays white, up to 0.3 mm long, stiff. Leaves with petioles 1–5(–10) mm long; lamina narrowly oblong, oblong-elliptic or rarely narrowly obovate, 0.6–3.5(–4) cm long, 0.2–1(–1.5) cm wide, concolorous; adaxial surface sparsely to densely stellate hairy or rarely glabrous; abaxial surface sparsely to densely stellate hairy; base obtuse to rounded or rarely attenuate; margin serrate or dentate-serrate; apex obtuse to rounded or rarely acute. Flower buds obovoid-ellipsoid, 1–2 mm across; apex obtuse with 4 or 5 erect caudae to 0.2 mm long. Sepals 5, rarely 4, narrowly obovate, 4–7 mm long, 1–2 mm wide; apex acuminate c. 0.7 mm long; abaxial surface with moderately dense to dense indumentum of stellate hairs up to 0.5 mm long; adaxial surface puberulous proximally, glabrous distally. Stamens 20–30(–40). Fruits 20–35 mm long, 1–2 mm across, dark purplish-red or rarely brown, weakly to strongly twisted, strongly constricted between the seeds, 2(rarely 3)-valved; apex attenuate up to 4 mm long; indumentum moderately dense to dense, of stellate hairs up to 0.3 mm long.

***Selected specimens (from 67 examined)*:** **Western Australia.** Dampier District: St Mary's School, Broome, Apr 1987, *Foulkes* 13 (CANB, PERTH); Munkajarra [Munkayarra], 20 km S of Derby, Apr 1983, *Fryxell* 3848 (CANB, MEL, PERTH); 9 km SE of Frazier Downs Station, Jul 1987, *Ingleby* JV28 (PERTH), c. 1225 km on North West Coastal Highway, Aug 1971, *Ashby* 3034 (AD); old Fitzroy R. crossing, Apr 1988, *Cranfield* 6414 (CANB, PERTH). Canning District: N of Dragon Tree Soak, Great Sandy Desert, Aug 1977, *George* 14768 (CANB, PERTH); just S of Tobin Lake, Great Sandy Desert, May 1979, *George* 15649 (CANB, DNA, PERTH). **Northern Territory.** Darwin and Gulf Region: 75 km E of Stuart Highway along Carpentaria Highway, Apr 1992, *Halford* Q1073 (BRI). Barkly Tablelands Region: 8 miles [c. 13 km] S of old Highland Plains, Jul 1976, *Henry* 253 (AD, DNA, MEL); 30 km N of Tennant Creek, Stuart Highway, Apr 1992, *Halford* Q1201 (BRI). Northern Central Region: Sangsters Bore, Tanami Desert, Sep 1978, *Henshall* 2277 (DNA); 2 km W of Lake Surprise, Tanami Desert, Jun 1985, *Latz* 10072 (DNA); 77 miles [c. 124 km] WSW [of] The Granites, Aug 1970, *Dunlop* 1812 (CANB, DNA); Central Mt Stuart, Jul 1974, *Latz* 5571 (BRI, CANB). **Queensland.** Cook District: site EU293, Barwidgee Homestead, E of Branch Creek, Feb 1992, *Godwin* C3718 (AD, BRI, DNA); 22 km E of Croydon, Apr 1992, *Halford* Q986 (BRI). Burke District: between Doomadgee Aboriginal Station and old "Corinda" outstation, May 1974, *Pullen* 9077 (CANB, DNA). Gregory North District: Oban Station, about 62 miles [c. 100 km] SW of Mt Isa, Woodend Bore, Dec 1947, *Everist* 3342 (BRI, CANB). Mitchell District: near Lochnagar, Nov 1935, *Blake* 10302 (BRI, CANB). South Kennedy District: 27.5 km W of St Anns Homestead, Jun 1992, *Thompson & Sharpe* BUC838 (BRI).

***Distribution and habitat*:** *Corchorus sidoides* subsp. *vermicularis* is widespread across northern Australia from the Pilbara, Western Australia, through the Northern Territory to the north-east coast of Queensland (**Map 5**). It is recorded as growing on sandy, loamy or gravelly soils, in hummock grassland, shrubland, open woodland and open forest communities, on plains, sand dunes and hills.

***Phenology*:** Flowers and fruits have been collected throughout the year.

***Notes*:** Generally a smaller more diffuse shrub than the other subspecies with slender stems, smaller leaves and twisted fruit. In the Kimberley region this subspecies grades into small leaf forms of *C. sidoides* subsp. *sidoides.*

17c. Corchorus sidoides subsp. **rostrisepalus** (Domin) Halford **comb. nov. & stat. nov.**

Corchorus rostrisepalus Domin, Biblioth. Bot. 89: 383 (1928). **Type:** [Northern Territory.] Carpentaria Island g, [Vanderlin Island, 15 Dec 1802,] *R. Brown* (lecto, here chosen: K; ?isolecto: BRI, CANB, MEL).

Shrub to 1 m high; stems sparingly to much branched, erect. Indumentum on young shoots and buds ferruginous. Stellate hairs up to 0.3 mm across, sessile or stalked; stalks white or reddish-brown, up to 0.2 mm long; rays white or ferruginous, up to 0.2 mm long, pliable. Leaves with petioles 3–13 mm long; lamina narrowly ovate or narrowly elliptic, 3.5–9 cm long, (0.5–)1.5–3 cm wide, discolorous; adaxial and abaxial surfaces moderately dense to dense or rarely sparsely stellate hairy; base obtuse or attenuate; margin serrate to serrulate; apex obtuse or acute. Flower buds obovoid, 2–3 mm across, longitudinally ridged distally; apex acuminate with 5 erect caudae to 1 mm long. Sepals 5, narrowly obovate, 5–6 mm long, c. 2 mm wide; apex acuminate-caudate up to 1 mm long; abaxial surface with moderately dense to dense indumentum of stellate hairs up to 0.2 mm long; adaxial surface stellate-pubescent proximally, glabrous distally. Stamens 30–35. Fruits 20–55 mm long, 1–2 mm across, pale-green to brown, straight or slightly curved, prominently constricted between seeds, 2(rarely 3)-valved; apex attenuate up to 4 mm long; indumentum moderately dense, of stellate hairs up to 0.2 mm long.

***Selected specimens (from 15 examined)*:** **Northern Territory.** Darwin and Gulf Region: 17 miles [c. 27 km] NNE [of] Mainoru, Jun 1972, *Byrnes* 2613 (DNA); South Bay, Bickerton Island, in the Gulf of Carpentaria, Jun 1948, *Specht* 605 (AD, BRI, CANB, MEL, NSW); Groote Eylandt, 4 km W [of] Umbakumba, Jul 1987, *Russell-Smith* 2738 & *Lucas* (DNA); Hemple Bay, Groote Eylandt, in the Gulf of Carpentaria, Apr 1948, *Specht* 283 (AD, BRI, CANB, MEL, NSW); Angurugu, Groote Eylandt, May 1972, *Levitt* [DNA 4462] (DNA); Nitmiluk Gorge NP, Feb 1990, *Evans* 2938 (DNA, CANB, MEL); Katherine Gorge [Nitmiluk] NP, Mar 1971, *Dunlop* & *Byrnes* 2157 (CANB, DNA, MEL); 12 miles [c. 19 km] NE of Katherine, Jan 1965, *Wilson* 79 (CANB, DNA); mouth of Rosie Creek, Lorella, Jan 1989, *Russell-Smith* 6752 & *Lucas* (BRI, DNA).

***Distribution and habitat*:** *Corchorus sidoides* subsp. *rostrisepalus* occurs in north-eastern Northern Territory from near Katherine eastward to the islands of the Gulf of Carpentaria (**Map 5**). It is recorded as growing in open woodland and open forest communities, on shallow rocky soils on hills or sandy soils on alluvial flats.

***Phenology*:** Flowers have been collected June, July and from December to April, fruits in December, January and from March to June.

***Notes*:** *Corchorus sidoides* subsp. *rostrisepalus* has a more erect habit, and generally a finer indumentum on its leaves and stems than the other subspecies of *Corchorus sidoides.*

***Typification*:** In the protologue of *C. rostrisepalus*, Domin (1928) referred to ‘ Carpentaria Islands, R. Brown als *C. vermicularis*’. There are three sheets at K of original Brown material from the Carpentaria Islands. The sheet with the small label with the information ‘Corchorus vermicularis No. 45 desc. Carpentaria Island g’ in Browns handwriting is here selected as lectotype. There are a number of possible duplicates of this material at a number of institutions (BRI, MEL, CANB) that have varying label details. Whether these other R. Brown sheets are all from the same collection as the lectotype or separate collections has not been ascertained.

18. Corchorus subargentus* Halford **sp. nov.** quoad staturam et formam foliorum *C. sidoidi* subsp. *rostrisepalo* et *C. obclavato* similis autem ab utroque fructibus erectis non pendulis differt. *Corchorus subargenteus* maxime arcte affinis *C. sublato* et *C. leptocarpo*; ab illo floribus majoribus (sepalis 10–11 mm longis, petalis 8–10 mm longis, filamentis staminalibus 5–6 mm longis, stylo 5–6 mm longo comparitis sepalis 7–9 mm longis, petalis 4–6 mm longis, filamentis staminalibus 3–4 mm longis, stylo 2–3 mm longo), indumentum caulium foliorumque (10–11 mm longis non 12–14 mm longis) petalis angustioribus (2–3 mm latis non c. 7 mm latis), filamentis staminalibus brevioribus (5–6 mm longis non 7–9 mm longis) differt. **Typus:** Queensland. North Kennedy: 13 km along Laroona road, off Paluma to Ewan road, 19°11', 145°55', 15 April 1996, *P.I. Forster* PIF18983 & *T. Ryan* (holo: BRI; iso: MEL, distribuendi).

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* should be '***subargenteus***' (PDB 2005)

Shrub to 2 m high; stems sparingly to much branched, erect; young shoots with silvery-grey or ferruginous indumentum. Indumentum on branchlets, leaves, stipules, peduncles, pedicels and bracts silvery-grey, dense, comprised of stellate hairs. Stellate hairs sessile or stipitate, up to 0.6 mm across; stipes white or red-brown, straight, up to 0.2 mm long; rays pliable, white or ferruginous, up to 0.4 mm long. Leaves with petioles 5–7 mm long; stipules subulate-linear, 2–3 mm long; lamina narrowly ovate, 3–8 cm long, 1–1.5 cm wide, l:w ratio 3–5.3:1, discolorous; base rounded; margin serrulate; apex rounded. Inflorescences umbellate or racemose, 5–7-flowered, leaf-opposed or lateral, solitary at upper nodes; peduncles 7–15 mm long; pedicels 2–7 mm long, spreading to erect in flower, erect in fruit; bracts subulate-linear, 2–4 mm long. Flower-buds obovoid-ellipsoid, 3–4 mm across, slightly longitudinally ridged; apex acute with 5 spreading caudae up to 1 mm long. Sepals 5, not persistent, narrowly obovate, 10–11 mm long, c. 2 mm wide; abaxial surface with a dense indumentum of stellate hairs up to 0.5 mm long; adaxial surface stellate-pubescent proximally, glabrous distally; apex caudate, up to 2 mm long. Petals 5; lamina narrowly obovate, 8–10 mm long, 2–3 mm wide, glabrous; claw c. 0.7 mm long, stellate-pubescent on margins. Androgynophore c. 0.2 mm long; annulus entire, c. 0.1 mm long, glabrous. Stamens 60–70; filaments 5–6 mm long; anthers c. 0.5 mm long. Ovary cylindrical, 0.9–1 mm across, densely stellate-puberulous, 3-locular, with 34–38 ovules in each locule; style 5–6 mm long. Fruits subcylindrical, 20–50 mm long, 2–2.5 mm across, 7–20 times longer than wide, ± circular in transverse section, erect , ± straight, slightly constricted between seeds, 3-valved; apex attenuate, 1–2 mm long, orientated upward; indumentum moderately dense to dense, of stellate hairs up to 0.1 mm long. Seeds compressed obovoid or columnar; 1–3 mm long. **Fig. 13.**

***Additional specimens*: Queensland.** North Kennedy District: 2.8 km S of Running River on Ewan–Laroona road, Feb 1996, *Cumming* 7548 (BRI).

***Distribution and habitat*:** *Corchorus subargentus* is confined to north-eastern Queensland where it is known only from the Running River area, approximately 90 km W of Townsville (**Map 3**). It is recorded as growing in eucalypt woodland with *Triodia* sp. in the understorey, on sandy soils on granite-quartz ridges.

***Phenology*:** Flowers have been collected in February and April, fruits in April.

***Affinities*:** *Corchorus subargentus* is similar in stature and leaf size to *C. sidoides* subsp. *rostrisepalus* and *C. obclavatus*. *Corchorus subargentus* differs from both of these by having erect rather than pendulous fruit. *Corchorus subargentus* is most closely related to *C. subulatus* and *C. leptocarpus*. It differs from *C. sublatus* by having larger flowers (sepals 10–11 mm long, petals 8–10 mm long, staminal filaments 5–6 mm long, style 5–6 mm long compared with sepals 7–9 mm long, petals 4–6 mm long, staminal filaments 3–4 mm long, style 2–3 mm long), slightly coarser indumentum on the stems and leaves, and longer and stouter peduncles (7–15 mm long compared with 2–5 mm long). *Corchorus subargentus* differs from *C. leptocarpus* by having a more slender stature and shorter sepals (10–11 mm long compared with 12–14 mm long), narrower petals (2–3 mm wide compared with c. 7 mm wide) and shorter staminal filaments (5–6 mm long compared with 7–9 mm long).

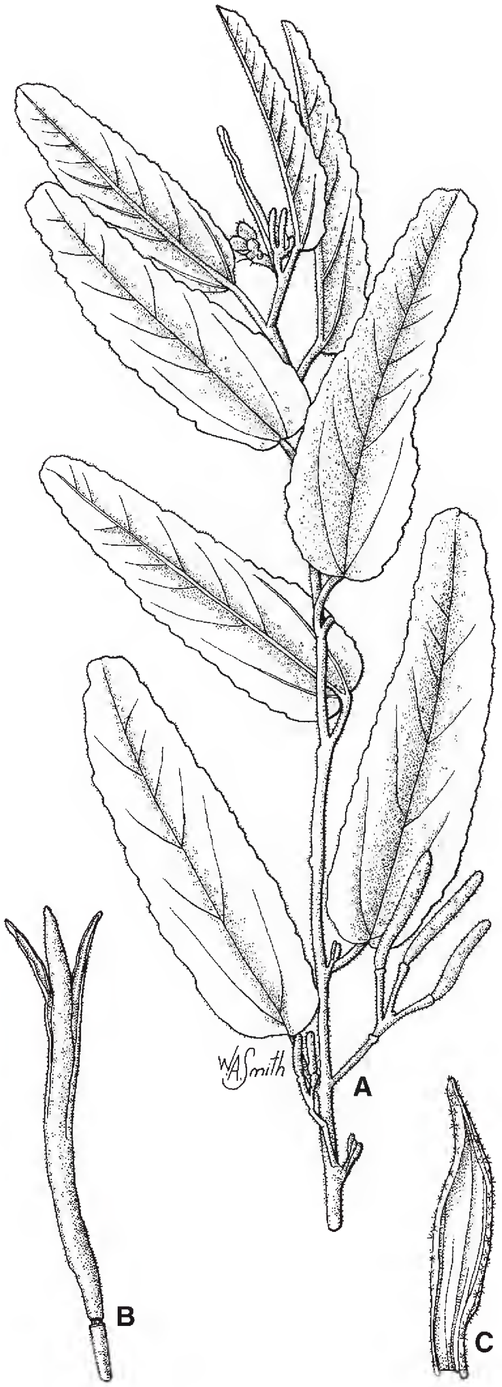

Fig. 13. *Corchorus subargentus*. A. branchlet with flower buds and fruit. × 1. B. fruit. × 1.5. C. ventral view of sepal. × 4. A & B from *Forster* PIF18983 (BRI); C from *Cumming* 7548 (BRI). Del. W. Smith.

Etymology: The specific epithet is from the Latin *sub-* somewhat, *argentea,* silvery, and is in reference to the appearance of the foliage of this species.

19. Corchorus sublatus Halford **sp. nov.** quoad staturam et amplitudinem foliorum *C. sidoidi* subsp. *rostrisepalo* et *C. obclavato* similis autem autem ab utroque fructibus erectis non pendulis differt. Per charactereum eius fructuum *C. sublatus*, *C. leptocarpo* et *C. subargenteo* similis. Ab eis *C. sublatus* floribus minoribus fructibus angustioribus differt (vide tabulam 1 pro comparationibus). Addite *C. sublatus* a subargenteo indumento tenuiore pedunculis brevioribus (2–5 mm longis non 7–15 mm longis) differt. **Typus:** Northern Territory. Darwin and Gulf Region: Baroalba Spring, Kakadu NP, 16 April 1992, *D. Halford* Q1114 (holo: DNA; iso: BRI, L, MEL, distribuendi).

Shrub to 1.5 m high; stems sparingly to much branched, erect; young shoots with grey-white or ferruginous indumentum. Indumentum on branchlets, leaves, stipules, peduncles, pedicels and bracts grey-white, moderately dense to dense, comprised of stellate hairs. Stellate hairs sessile or stipitate, up to 0.2 mm across; stipes white, straight, up to 0.2 mm long; rays pliable, white or ferruginous, up to 0.1 mm long. Leaves petioles 5–15 mm long; stipules subulate-linear, 3–5 mm long; lamina narrowly ovate or rarely narrowly oblong, 3–11 cm long, 0.7–2.5 cm wide, l:w ratio 4–5.5:1, discolorous; base rounded or rarely attenuate; margin serrulate; apex acute. Inflorescences umbellate, 6–8-flowered, leaf-opposed or lateral, solitary at upper nodes; peduncles 2–5 mm long; pedicels 2–5 mm long, spreading to erect in flower, spreading to recurved in fruit; bracts subulate-linear, 3–5 mm long. Flower-buds obovoid-ellipsoid, 4–5 mm across, longitudinally ridged; apex acute with 5 spreading caudae up to 2 mm long. Sepals 5, not persistent, narrowly obovate, 7–9 mm long, 1–2 mm wide; abaxial surface with a moderately dense indumentum of stellate hairs up to 0.5 mm long; adaxial surface stellate-pubescent proximally, glabrous distally; apex caudate, up to 3 mm long. Petals 5; lamina narrowly obovate to obovate, 4–6 mm long, 2–4 mm wide, glabrous; claw 0.7–1 mm long, stellate-pubescent on margins. Androgynophore 0.3–0.6 mm long; annulus sinuate or entire, 0.2–0.3 mm long, glabrous. Stamens 40–60; filaments 3–4 mm long; anthers c. 0.5 mm long. Ovary cylindrical, 0.7–0.8 mm across, densely stellate-puberulous, 3-locular, with 20–26 ovules in each locule; style 2–3 mm long. Fruits subcylindrical, 20–50 mm long, 1–2 mm across, 10–25 times longer than wide, erect, straight or if on recurved pedicels then abruptly bent near base so that the fruit is perpendicular with the apex pointing upwards, circular in transverse section, slightly constricted between seeds, 3-valved; apex attenuate, 1–2 mm long; indumentum moderately dense to dense of stellate hairs up to 0.2 mm long. Seeds compressed obovoid or columnar; 1–3 mm long. **Fig. 14.**

***Selected specimens (from 8 examined)*: Northern Territory.** Darwin and Gulf Region: Kakadu NP, Baroalba Springs, May 1983, *Fryxell & Craven* 4270 (CANB, DNA); Baroalba Spring, Kakadu NP, Apr 1992, *Halford* Q1131 (BRI); near mouth of Sawcut Gorge, 28.5 km SSE of Jabiru East, Jun 1980, *Craven* 6279 (CANB); c. 7 miles [c. 11 km] W of Mt Gilruth, Mar 1973, *Lazarides* 7951 (BRI, CANB, DNA, NSW); 1 km upstream from Twin Falls, Mar 1988, *Fensham* 880 (DNA).

Table 2. Morphological comparison of *Corchorus sublatus*, *C. subargentus* and *C. leptocarpus*.

Characters	***C. sublatus***	***C. subargentus***	***C. leptocarpus***
sepals (mm)	7–9 × 1–2	10–11 × c. 2	12–14 × c. 3
petals (mm)	4–6 × 2–4	8–10 × 2–3	8–10 × c. 7
fruits width (mm)	1–2	2–3	2–3

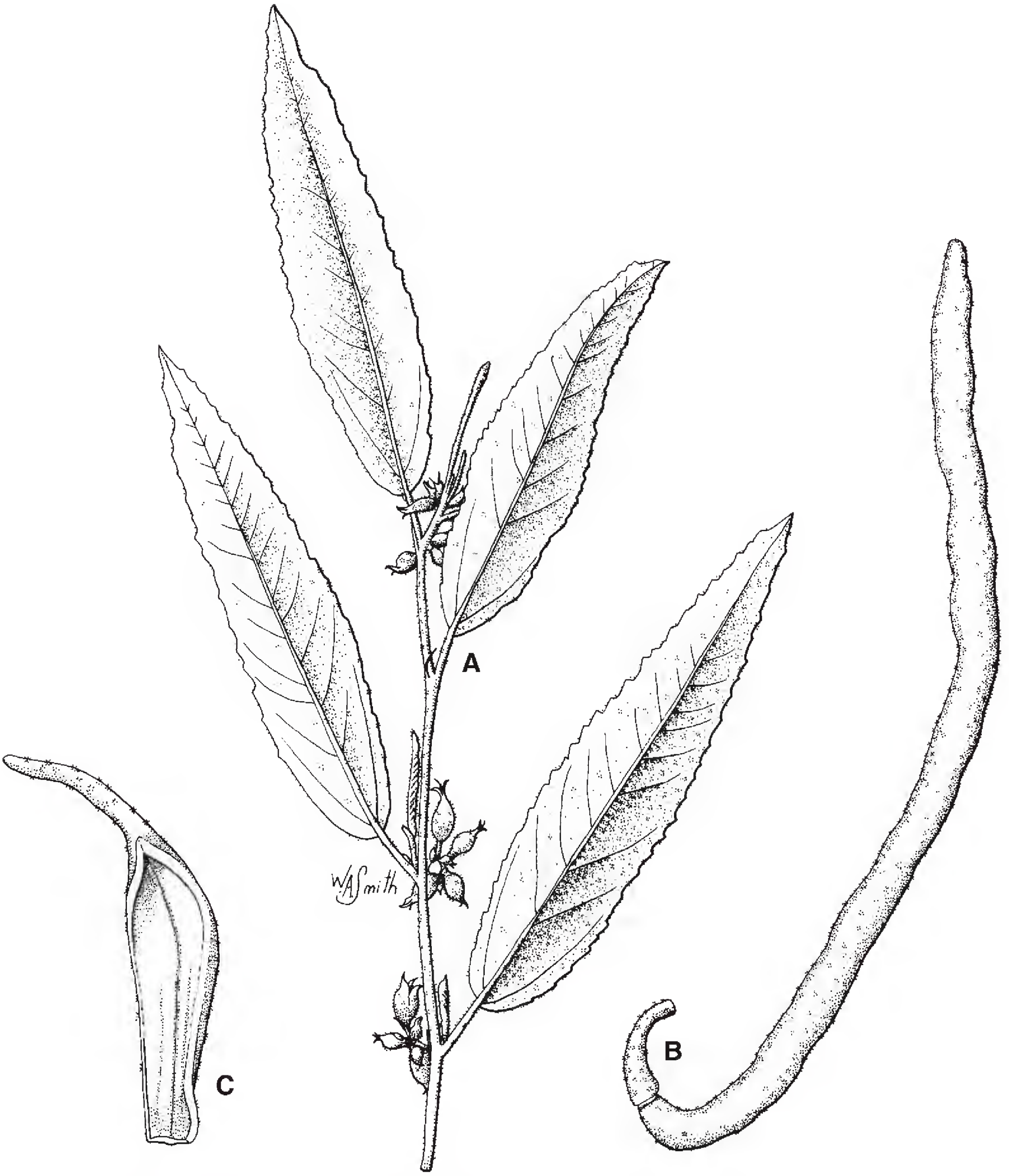

Fig. 14. ***Corchorus sublatus.*** A. branchlet with flowers. × 1. B. fruit. × 3. C. ventral view of sepal. × 6. A from *Halford* Q1114 (BRI); B, C from *Halford* Q1112 (BRI). Del. W. Smith.

***Distribution and habitat*:** *Corchorus sublatus* is confined to Arnhem Land in the Northern Territory, from Mt Gilruth southwards to Twin Falls (**Map 6**). It is recorded as growing in heathland, woodland and open forest communities on sandy soils on talus slopes or on gravelly soils on sandstone plateaus.

***Phenology*:** Flowers have been collected in March and April, fruits from April to June.

***Affinities*:** *Corchorus sublatus* is similar in stature and leaf size to *C. sidoides* subsp. *rostrisepalus* and *C. obclavatus*. *Corchorus sublatus* differs from both of these by having erect rather than pendulous fruit. In this character *C. sublatus* resembles *C. leptocarpus* and *C. subargentus*. *Corchorus sublatus* differs from both of these species by having smaller flowers and narrower fruits (see Table 2 for comparison). In addition, *C. sublatus* differs from *C. subargentus* by having a finer indumentum and shorter peduncles (2–5 mm long compared with 7–15 mm long).

***Etymology*:** The specific epithet refers to the orientation of the fruit; Latin *sublatus* raised aloft.

20. Corchorus tectus Halford **sp. nov.** a *C. sericeio* foliis anguste oblongis usque oblongis distinguenda. **Typus:** Western Australia. Fortescue District: 53 miles [c. 85 km] S of Roebourne on Wittenoom road, 3 March 1962, *A.S. George* 3488 (holo: PERTH).

Open shrub to 70 m high; stems much branched, spreading. Indumentum on young shoots, branchlets, leaves, stipules, peduncles, pedicels and bracts grey-white, moderately dense to dense, comprised of mostly stellate hairs but dendritic-stellate hairs also present. Stellate hairs sessile or stipitate, up to 1 mm across; stipes red-brown or white, straight or tortuous, up to 0.2 mm long; rays soft to pliable, white, up to 0.6 mm long. Dendritic-stellate hairs up to 0.5 mm long; stipes white or red-brown, tortuous; rays pliable, white, up to 0.6 mm long. Leaves with petioles 7–15 mm long; stipules subulate-linear, 1–3 mm long; lamina narrowly oblong to oblong, 2–4.5 cm long, 0.6–1.5 cm wide, l:w ratio 2.8–3.5:1, discolorous or concolorous; base obtuse to rounded or rarely cordate; margin crenulate; apex acute to rounded. Inflorescences umbellate or racemose, 4–8-flowered, leaf-opposed, solitary at upper nodes; peduncles 1–10 mm long; pedicels 1–7 mm long, spreading to erect in flower and fruit; bracts subulate-linear, 2–5 mm long. Flower buds ellipsoid, 2–4 mm across; apex obtuse with 5 spreading caudae to 2 mm long. Sepals 5, persistent, narrowly obovate-elliptic, 5–6.5 mm long, 1–1.5 mm wide; abaxial surface with a dense indumentum of stellate and dendritic-stellate hairs, the largest hairs up to 1 mm long; adaxial surface villose proximally, glabrous distally; apex caudate, up to 2 mm long. Petals 5; lamina obovate, 5–7 mm long, 3–5 mm wide, glabrous; claw 0.7–0.8 mm long, sparsely pubescent. Androgynophore 0.1–0.3 mm long; annulus entire, 0.2–0.4 mm long, glabrous. Stamens 45–95; filaments 2.5–5.5 mm long; anthers c. 0.5. Ovary globose, 1.5–2 mm across, densely stellate-tomentose, 3-locular, with 2–8 ovules in each locule; style 3–5 mm long. Fruits globose, 2–4 mm across, circular in transverse section, not constricted between seeds, 3-valved; apex rounded rarely obtuse; indumentum dense of stellate hairs up to 0.7 mm long. Seeds compressed obovoid, 1.2–1.8 mm long. **Fig. 15.**

***Selected specimens (from 11 examined)*: Western Australia.** Fortescue District: Robe R., between Onslow and Roebourne, Aug 1966, *Butler* 20 (PERTH); Fortescue R., Jun 1878, *Forrest* s.n. [MEL227315] (MEL); Fortescue R., 1895, *Cusack* s.n. [MEL560600] (MEL); Roebourne, 1897, *Cusack* s.n. [MEL1599108] (MEL); 3 km NE of Three Peak Hills, Pannawonica road, Mar 1984, *Newbey* 9889 (PERTH); Hamersley Range, Aug 1958, *Ride* s.n. [PERTH 1524739] (PERTH); Hamersley Range, *Ride* s.n. [PERTH 1524690] (PERTH).

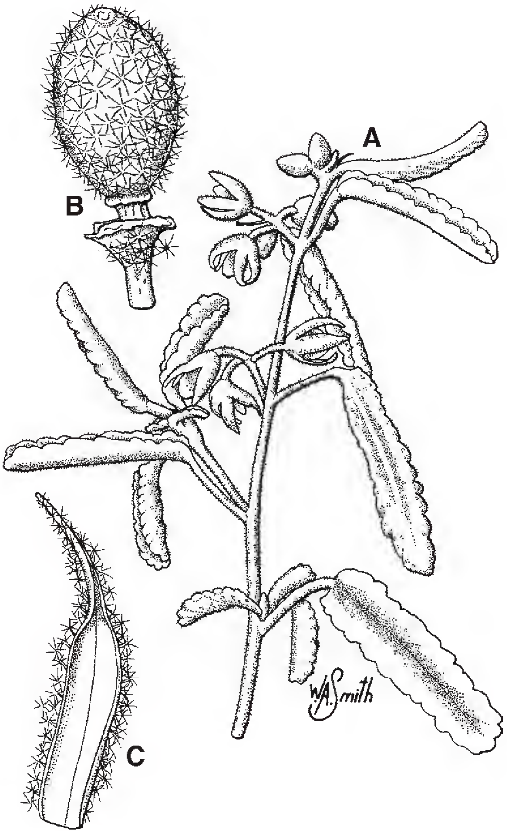

Fig. 15. ***Corchorus tectus.*** A. branchlet with flowers. × 1. B. fruit with persistent sepals removed. × 6. C. ventral view of sepal. × 6. A from *van Leeuwen* 4376 (BRI); B, C from *Bulter* 20 (BRI). Del. W. Smith.

Distribution and habitat**:** *Corchorus tectus* occurs in north-western Western Australia, from Robe River eastward to near Millstream Station (**Map 7**). It is recorded as growing in open shrubland communities on gravelly soils along watercourses.

Phenology**:** Flowers have been collected in March, June, August and September, fruits in March and August.

Affinities**:** *Corchorus tectus* is similar to *C. sericeus* but differs from that by having narrowly oblong to oblong leaves.

Etymology**:** The specific epithet is from Latin *tectus*, meaning 'covered', in reference to the persistent calyx lobes that cover the fruit of this species.

21. Corchorus tomentellus F.Muell., Fragm. 3: 10 (1862). **Type:** [Queensland.] Mackenzie River, [without date,] *F. Mueller* s.n. [lecto, here chosen: MEL [MEL220813]).

Shrub to 0.3 m high; stems much branched, spreading. Indumentum on young shoots, branchlets, leaves, stipules, peduncles, pedicels and bracts grey-white, moderately dense, comprised of stellate hairs. Stellate hairs sessile or stipitate, up to 0.7 mm across; stipes red-brown, straight, up to 0.3 mm long; rays firm, white, up to 0.5 mm long. Leaves with petioles 3–5 mm long; stipules subulate-linear, 1–3 mm long; lamina ovate, 1.5–3.5 cm long, 0.8–2 cm wide, l:w ratio 1.3–2.2:1, discolorous; base rounded; margin serrate; apex acute to obtuse. Inflorescences umbellate, 2 or 3-flowered, leaf-opposed, solitary at upper nodes; peduncles 1–2 mm long; pedicels 2–4 mm long, spreading to erect in flower, recurved in fruit; bracts subulate-linear, 1–3 mm long. Flower buds ellipsoid, 2–3 mm across, apex acute. Sepals 5, not persistent, narrowly obovate, 6–7 mm long, 1–2 mm wide; abaxial surface with a moderately dense indumentum of stellate hairs up to 0.5 mm long; adaxial surface stellate-pubescent proximally, glabrous distally; apex acute to acuminate, up to 0.4 mm long. Petals 5; lamina obovate, 5–7 mm long, 2–5 mm wide, glabrous; claw c. 0.7 mm long, stellate-pubescent on abaxial surface and margins. Androgynophore 0.3–0.4 mm long; annulus entire, c. 0.2 mm long, glabrous. Stamens 50–60; filaments 2–4 mm long; anthers 2–4 mm long. Ovary cylindrical; c. 0.8 mm across, densely stellate-puberulous, 2 or 3-locular, with c. 26 ovules in each locule; style c. 3 mm long. Fruits subcylindrical, 15–65 mm long, 0.7–1.5 mm across, 7–35 times longer than wide, pendulous, straight or slightly curved, circular in transverse section, markedly constricted between seeds, 2 or 3-valved; apex acute or attenuate, 1–3 mm long, orientated downward; indumentum moderately dense to dense, of stellate hairs up to 0.4 mm long. Seeds compressed obovoid, c. 2 mm long.

Selected specimens (from 18 examined)**: Queensland.** South Kennedy District: tributary of Hazelwood Creek near pipeline, Apr 1978, *Byrnes & Clarkson* 3779 (BRI). Leichhardt District: near Lake Elphinstone, Jan 1993, *Fensham* 441 (BRI) Carborough Range, 1 km NW of Lake Elphinstone outlet, *Telford* 11125 & *Rudd* (BRI); telecom road, 14 km E of Comet, *Bean* 7520 & *Forster* (BRI); South Blackwater Mine, Laleham, Jan 1986, *Thompson* s.n. [AQ399040] (BRI); South Blackwater Mine, Dec 1990, *Thompson* 10 (BRI); Brigalow Research Station, 30 km NW of Theodore, Apr 1977, *Johnson* 3517 & *Batianoff* (BRI); Brigalow Research Station, 32 km NW of Theodore, Jul 1970, *Johnson* 2890 (BRI); 'Humboldt', 45 km NE of Rolleston, *Bean* 9573 (BRI); near 'Moorooloo', E of Springsure, *Bean* 14172 (BRI). Burnett District: "Narayen", Mundubbera, Feb 1967, *Tothill* N325 (BRI); "Narayen" about 30 miles [c. 48 km] W of Mundubbera, Feb 1968, *Tothill* N443 (BRI).

Distribution and habitat**:** *Corchorus tomentellus* occurs in subcoastal areas of central and southern Queensland from near Nebo southward to Mundubbera (**Map 3**). It is recorded as growing in shrubland, eucalypt woodland and eucalypt open forest communities on sandy soils or in brigalow open forest communities on clay soils.

Phenology**:** Flowers have been collected in April, October and from December to March, fruits in April, July, October and from December to March.

Typification**:** In the protologue of *Corchorus tomentellus*, Mueller (1862) did not cite any particular collection but stated "In graminosis herbidis ad flumina Dawson et MacKenzie". A single collection [MEL220813] (Mackenzie River, trop. Austr.) which can be considered part of the original material that Mueller used to draw up his description of this species has been located at MEL. The collection has flowers and is chosen as the lectotype to Mueller's name *C. tomentellus*.

***Notes*:** *Corchorus tomentellus* is closely related to *C. sidoides* but can be distinguished from that by its generally sparser indumentum on most parts, relatively broader and shorter leaves and generally narrower fruit.

22. Corchorus walcottii F.Muell., Fragm. 3: 9 (1862); *Corchorus walcottii* F.Muell. var. *walcottii*, Benth., Fl. Austral. 1: 279 (1863). **Type:** [Western Australia.] Hearson Island, *P. Walcott* (lecto, here chosen: MEL [MEL223678]).

Corchorus sp. Burrup (G.Craig 235), Paczkowska & Chapman (2000).

Shrub to 1.5 m high; stems much branched, spreading. Indumentum on young shoots, branchlets, leaves, stipules, peduncles, pedicels and bracts grey-white, moderately dense to dense, comprised of mostly stellate hairs but simple and dendritic-stellate hairs also present. Stellate hairs sessile or stipitate, up to 1.5 mm across; stipes, white, straight, up to 0.5 mm long; rays soft, white, up to 1.5 mm long. Dendritic-stellate hairs up to 2 mm long; stipes white or red-brown, tortuous; rays soft, white, up to 0.5 mm long. Simple hairs glandular, dull yellow, flexuous, 1–4 mm long. Leaves with petioles 7–30 mm long; stipules subulate-linear, 4–25 mm long; lamina narrowly ovate to broadly ovate, 3–9 cm long, 2.5–6 cm wide, l:w ratio 1.2–2.5:1, concolorous; base rounded or slightly cordate; margin serrate; apex obtuse to rounded. Inflorescences umbellate, 3–5-flowered, leaf-opposed, solitary at nodes; peduncles 5–25 mm long; pedicels 5–20 mm long, spreading to erect in flower and fruit; bracts narrowly ovate, 2–17 mm long. Flower-buds globose, 7–10 mm across; apex obtuse usually with 5 spreading caudae up to 2 mm long. Sepals 5, not persistent, narrowly obovate-elliptic, 8–18 mm long, 3–5 mm wide; abaxial surface with a very dense indumentum of mostly stellate and simple hairs but dendritic-stellate hairs occasionally present, the largest hairs up to 1.5 mm long; adaxial surface stellate hairy over whole surface or restricted to the proximal third; apex acute, acuminate or caudate, 1–4 mm long. Petals 5; lamina obovate to broadly obovate, 7–13 mm long, 6–10 mm wide, glabrous; claw 0.3–1 mm long, stellate pubescent on abaxial surface and margins. Androgynophore c. 0.2 mm long; annulus entire, c. 0.2 mm long, glabrous. Stamens 80–180; filaments 3–7 mm long; anthers c. 0.5 mm long. Ovary subglobose or shortly pentagonal-cylindrical, c. 1.8 mm across, densely stellate-tomentose, 5-locular, with 24–26 ovules in each locule; style 3–7 mm long. Fruits narrowly ovoid-ellipsoid or subcylindrical, 7–25 mm long, 3–9 mm across, 2–5 times longer than wide, straight or slightly curved, circular in transverse section, not constricted between seeds, 4 or 5-valved; apex rounded; indumentum dense of dendritic-stellate and a few simple glandular hairs, the largest hairs up to 2 mm long. Seeds compressed obovoid, c. 2 mm long. **Fig. 16.** Chromosome No. 2n = 14 (Islam & Qaiyum 1961; Datta *et al.* 1966).

***Selected specimens (from 35 examined)*:** **Western Australia.** FORTESCUE DISTRICT: 2 km S of landing strip, Barrow Island, May 1964, *Goodall* 1520 (PERTH); Sholl Island, Oct 1949, *Serventy* s.n. [PERTH1521519] (PERTH); Dolphin Island, Dampier Archipelago, Jun 1962, *Royce* 7169 (PERTH); Dampier turnoff (south), Nov 1979, *Demarz* 2864 (PERTH); North West Coastal Highway, c. 15 km by road WSW of main turnoff to Dampier, c. 8 km by road ENE of Karratha Homestead turnoff, Aug 1977, *Jackson* 3034 (AD); 5 km NE of George R. crossing of North West Coastal Highway, 42 km from Roebourne, Aug 1977, *Telford* 6547 (CANB); Karratha, Jul 1981, *Craig* 235 (PERTH); Pt Samson, Jul 1981, *Craig* 212 (PERTH); Woodstock Station, (S of Port Hedland), May 1958, *Burbidge* 5974 (AD, PERTH); Woodstock Station, Apr 1958, *Burbidge* 5811 (AD, PERTH); 90 km N of Nullagine, Great Northern Highway, May 1979, *Mitchell* 1245 (PERTH). **Northern Territory.** CENTRAL NORTHERN REGION: Mongrel Downs, Apr 1971, *Dunlop* 2105 (AD, BRI, MEL); S of Mongrel Downs Station, Aug 1976, *Latz* 8211 (DNA, MEL); Tanami Desert, 8 km NE of Sangsters Bore, Sep 1978, *Henshall* 2276 (AD, DNA); 42 miles [c. 68 km] NW of Chilla Well, Jul 1970, *Dunlop* (DNA). CENTRAL SOUTHERN REGION: 8.4 km E of W.A. Border on Kintore road, Apr 1988, *Leach* 1950 (CANB); Mt Liebig, 168 miles [c. 269 km] W of Alice Springs, Jul 1966, *Willis* s.n. (DNA, MEL); Mt Liebig, north side, ± 210 km WNW of Alice Springs, Jun 1974, *Carr* 2368 & *Beauglehole* 46147 (MEL); ± 6.4 km NNW of Mt Zeil, Jul 1968, *Beauglehole* 27181 (MEL).

***Distribution and habitat*:** *Corchorus walcottii* has a disjunct distribution. It occurs in the Pilbara region, Western Australia, from Barrow Island to near Marble Bar, and in central Australia from the Tanami Desert in the Northern Territory southwards to Mt Agnes in the north-west of South Australia (**Map 2**). It is recorded as growing in hummock grassland, shrubland and low open woodland communities, on sandy or loamy soils

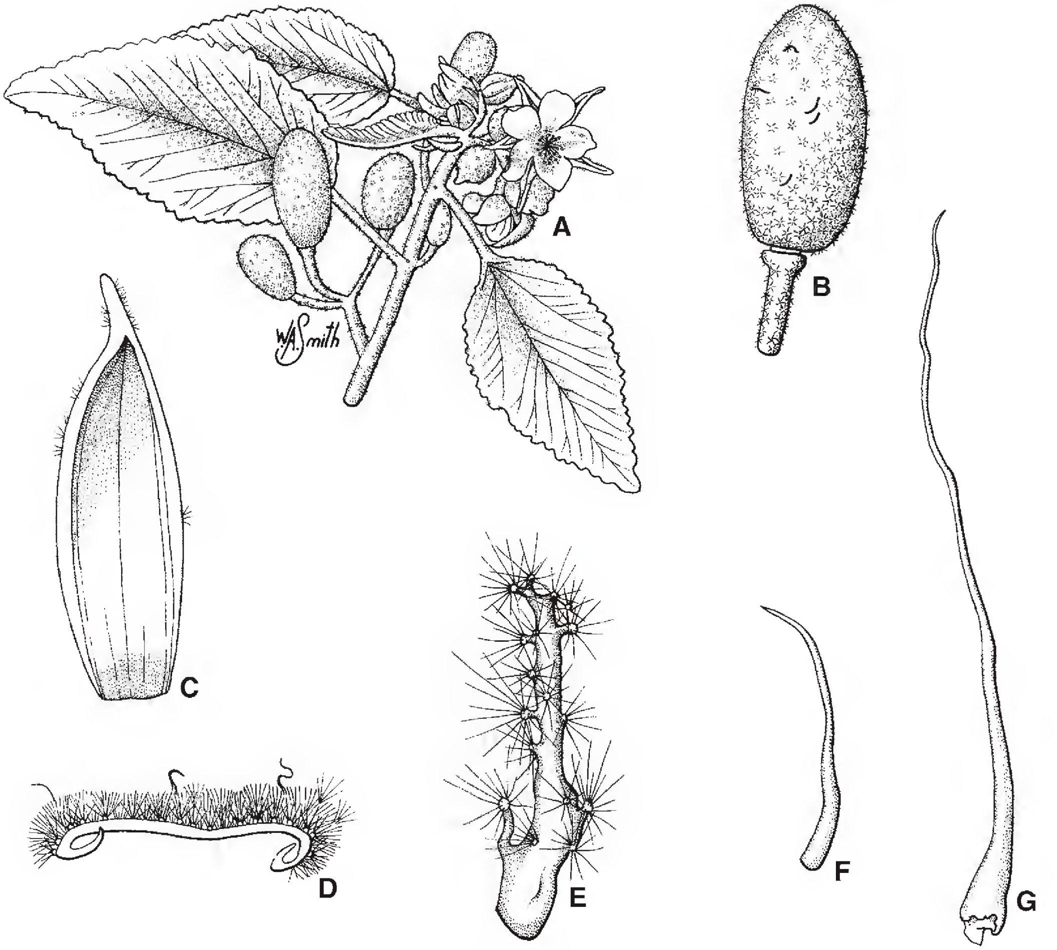

Fig. 16. ***Corchorus walcottii.*** A. branchlet with flower and fruit. × 1. B. fruit. × 02. C. ventral view of sepal. × 6. D. cross-section of sepal. × 12. E. dendritic-stellate hair. × 24. F. simple glandular hair. × 48. G. simple glandular hair. × 24. A–F from *Telford* 6547 (CANB); G from *Burbidge* 5811 (PERTH). Del. W. Smith.

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sometimes associated with limestone, on plains and hills. It is also recorded on coastal dunes.

***Phenology*:** Flowers have been collected in March, April, June, July, September and November, fruits in March, April, June and November.

***Typification*:** In the protologue of *Corchorus walcottii*, Mueller (1862) cited two collections "in collibus altioribus rupestribus prope Nickol Bay et in Hearson island. P. Walcott" The two collections referred to by Mueller in his protologue were located amongst material on loan to BRI from MEL "elevated rocky hills, Nichol Bay [MEL223677] and "growing on top of rocky sandstone hill, Hearson island" [MEL223678]. The specimen collected from Hearson Island is selected as lectotype as it is the better preserved specimen with flowers and fruits attached.

***Affinities*:** *Corchorus walcottii*, *C. parviflorus* and *C. laniflorus* have conspicuous simple glandular hairs present amongst the dense stellate indumentum on the stems, leaves and inflorescences.

For differences with *C. parviflorus* and *C. laniflorus* refer to 'Notes' under those species.

Notes**:** *Corchorus walcottii* as treated here is a variable species. The central Australian populations are somewhat different in having a shorter indumentum on the leaves from the typical form of this species from the Pilbara. There is another form on the islands off the Pilbara coast that has smaller leaves and flowers than the typical form, but it intergrades with the typical material of this species.

Excluded names

Corchorus allenii F.Muell., Proc. Linn. Soc. N.S.W. ser.2 6: 462 (1892). **Type:** near Prince Regent River; Bradshaw & Allen (holo: MEL) = ***Helicteres*** sp. (Sterculiaceae)

Corchorus longipes Tate, Transactions of the Royal Society of S.A. 22: 119 (1898). **Type:** Mt Lyndhurst Run near Farina, S.A., 1898, Max Koch s.n. (holo: AD) = ***Gilesia biniflora*** F.Muell. (Sterculiaceae).

Corchorus pachyphyllus Burret, Notizbl. Bot. Gart. Berlin, 12: 166 (1937). **Type citation:** [Western Australia.] Gascoyne, nördlich bei Carnarvon, c. 25 miles ü. d. M. Sandige Hügel mit lichtem Gebüsch, L. Diels 3718; *n.v.*

The type of this species has apparently been destroyed in Berlin during the Second World War and I have been unable to locate any material that may be considered an isotype. The description and discussion in Burret's protologue for this species is lengthy but it has not been possible to say to which known species it is referable.

Corchorus rothii F.Muell., Second Systematic Census of Australian Plants. 30 (1889), *nom. illeg.* **Type:** based on ***Triumfetta pilosa*** Roth.

Acknowledgements

I would like to thank Gordon Guymer, Director of BRI, for making working space and facilities at BRI available to me, the directors and curators of AD, CANB, DNA, K, MEL, NSW, P and PERTH for the loan of their holdings for study at BRI. The following persons provided assistance and they are thanked sincerely for their efforts; Laurie Jessup and Greg Leach for assistance while they were Australian Botanical Liaison Officer at K, Will Smith (BRI) for the illustrations and maps and Les Pedley for the translation of the diagnoses into Latin. This work was supported by grants from the Australian Biological Resource Study, Environment Australia in 1991, 1992 and 1994, which are gratefully acknowledged.

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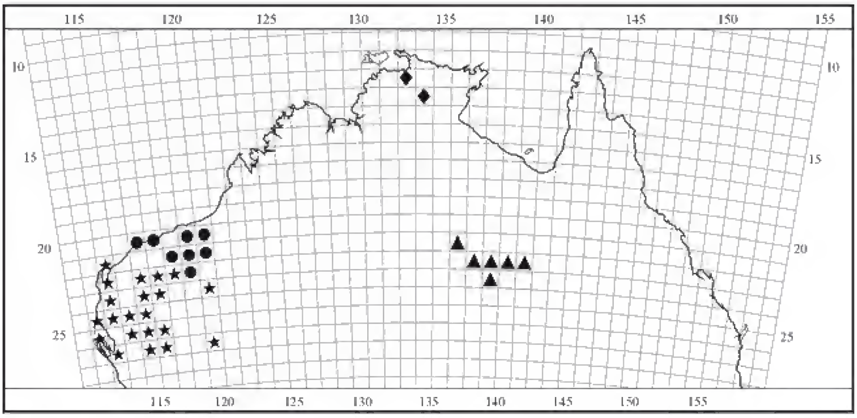
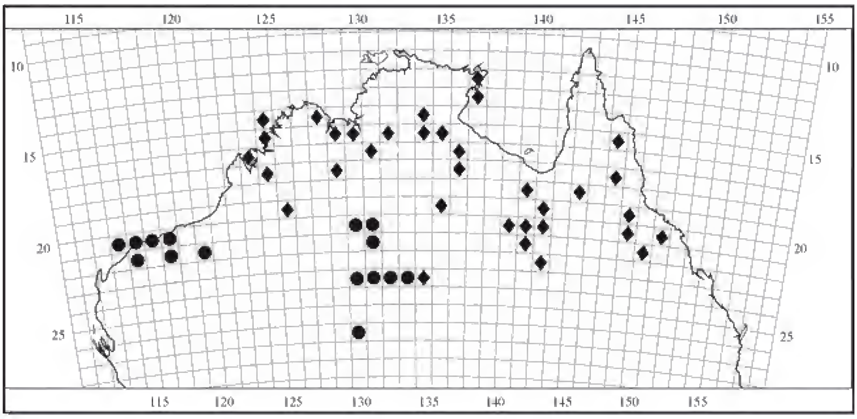
Index to Scientific Names

Names in bold type are accepted names and those in light are synonyms, etc. The numbers refer to the number of the species accepted in the above taxonomic treatment. ‘Excl.’ refers to a name listed under Excluded names.

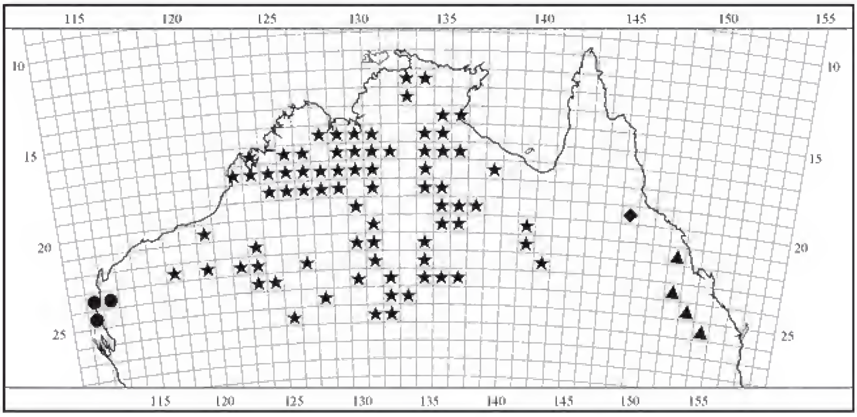
Corchorus allenii F.Muell. .... Excl.
Corchorus aulacocarpus Halford 1
Corchorus carnarvonensis Halford 2
Corchorus congener Halford 3
Corchorus crassifolius Domin 4
Corchorus crozophorifolius (Baill.) Burret 4
Corchorus elachocarpus F.Muell. 5
Corchorus elderi F.Muell. 6
Corchorus incanus Halford 7
Corchorus incanus Halford subsp. ***incanus*** 7a
Corchorus incanus subsp. ***lithophilus*** Halford 7b
Corchorus interstans Halford ms 3
Corchorus laniflorus Rye 8
Corchorus lasiocarpus Halford 9
Corchorus lasiocarpus Halford subsp. ***lasiocarpus*** .. 9a
Corchorus lasiocarpus subsp. ***parvus*** Halford 9b
Corchorus leptocarpus A.Cunn. ex Benth. 10
Corchorus lithophilus Halford ms 7b
Corchorus longipes Tate .... Excl.
Corchorus mitchellensis Halford 11
Corchorus obclavatus Halford 12
Corchorus pachyphyllus Burret .... Excl.
Corchorus parviflorus (Benth.) Domin 13
Corchorus parviflorus (Benth.) Domin var. *parviflorus* 13
Corchorus parviflorus var. *gracilescens* Domin 13
Corchorus parviflorus var. *ovatus* Domin 13
Corchorus puberulus Halford 14
Corchorus pumilio R.Br. ex Benth. 15
Corchorus rostrisepalus Domin 17c
Corchorus rothii F.Muell. .... Excl.
Corchorus saxicola Halford ms 7b
Corchorus sericeus Ewart & O.B.Davies 16
Corchorus sericeus Ewart & O.B.Davies subsp. ***sericeus*** 16a
Corchorus sericeus subsp. ***densiflorus*** (Benth.) Halford 16b
Corchorus sidoides F.Muell. 17
Corchorus sidoides F.Muell. subsp. ***sidoides*** 17a
Corchorus sidoides subsp. ***rostrisepalus*** (Domin) Halford 17c
Corchorus sidoides subsp. ***vermicularis*** (F.Muell.) Halford 17b
Corchorus sp. Burrup (G.Craig 235) 22
Corchorus subargentus Halford 18
Corchorus sublatus Halford 19
Corchorus tectus Halford 20
Corchorus tomentellus F.Muell. 21
Corchorus vermicularis F.Muell. 17b
Corchorus walcottii F.Muell. 22
Corchorus walcottii F.Muell. var. *walcottii* 22
Corchorus walcottii var. *densiflorus* Benth. 16b
Corchorus walcottii var. *parviflorus* Benth. 13
Nettoa crozophorifolia Baill. 4
Scorpia simplicifolia Ewart & A.H.K.Petrie 17b



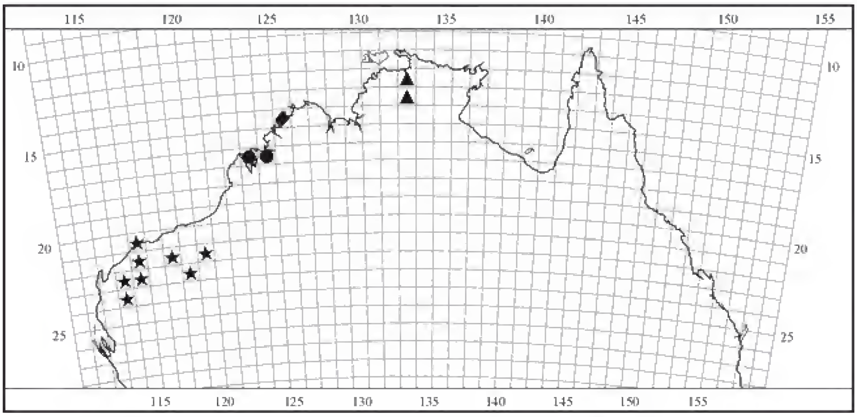
Map 1. Distribution of *Corchorus* spp. *C. parviflorus* ● , *C. crozophorifolius* ★ , *C. elderi* ▲ , *C. obclavatus* ◆ .



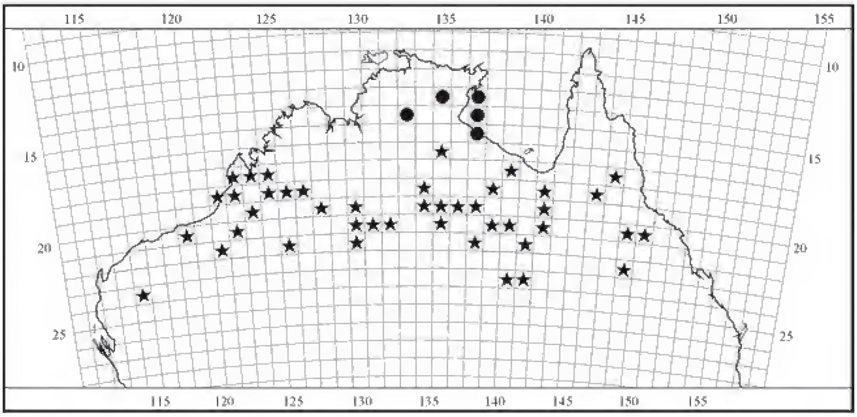
Map 2. Distribution of *Corchorus* spp. *C. walcottii* ● , *C. pumilio* ♦ .



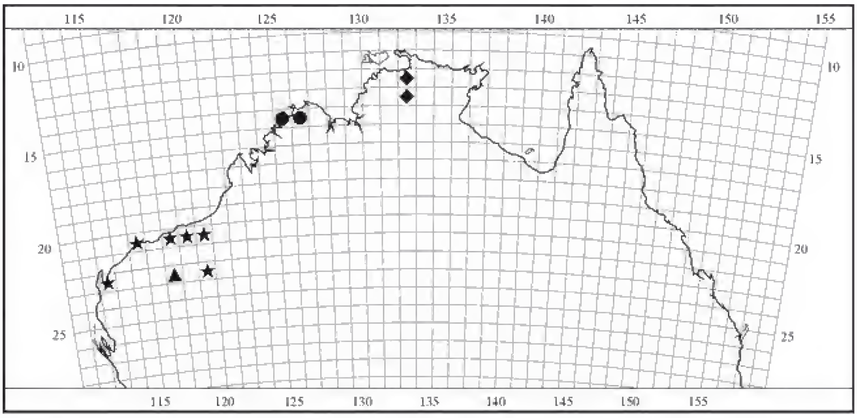
Map 3. Distribution of *Corchorus* spp. *C. sidoides* subsp. *sidoides* ★ , *C. carnarvonensis* ● , *C. tomentellus* ▲ , *C. subargentus* ◆ .



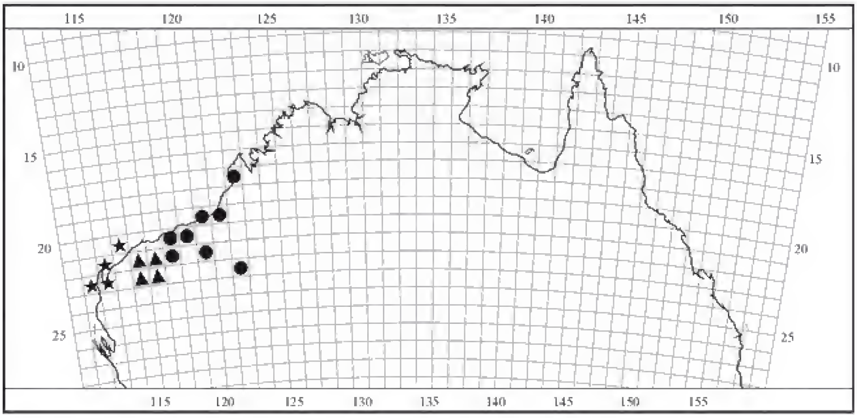
Map 4. Distribution of *Corchorus* spp. *C. laniflorus* ★ , *C. puberulus* ● ,*C. mitchellensis* ◆ , *C. aulacocarpus* ▲ .



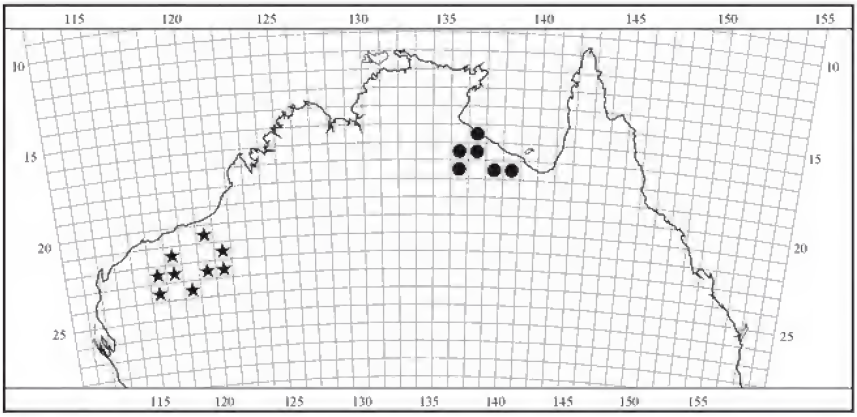
Map 5. Distribution of *Corchorus* spp. *C. sidoides* subsp. *vermicularis* ★ , *C. sidoides* subsp. *rostrisepalus* ● .



Map 6. Distribution of *Corchorus* spp. *C. elachocarpus* ★ , *C. incanus* subsp. *lithophilus* ▲ , *C. leptocarpus* ● , *C. sublatus* ◆ .



Map 7. Distribution of *Corchorus* spp. *C. incanus subsp. incanus* ● , *C. congener* ★ , *C. tectus* ▲ .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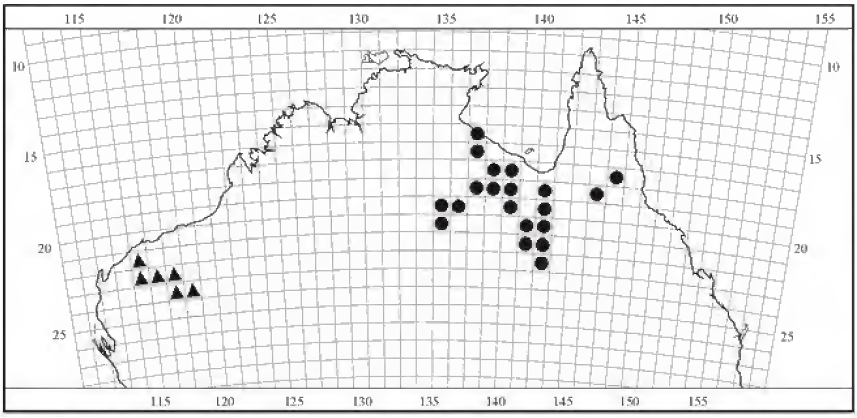
Map 8. Distribution of *Corchorus* spp. *C. lasiocarpus* subsp. *lasiocarpus* ★, *C. sericeus* subsp. *sericeus* ●.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Map 9. Distribution of *Corchorus* spp. *C. lasiocarpus* subsp. *parvus* ▲, *C. sericeus* subsp. *densiflorus* ●.

Stictocardia Hallier f. (Convolvulaceae) in Queensland

R.W. Johnson

Summary

Johnson, R.W. (2004). *Stictocardia* Hallier f. (Convolvulaceae) in Queensland. *Austrobaileya* 6 (4): 631-637. Two species of *Stictocardia* are recognised from Queensland. A new combination *S. queenslandica* (Domin) R.W.Johnson, based on *Argyreia queenslandica* Domin, is made. A key to identify both species is provided, together with descriptions, distribution maps and illustrations of certain diagnostic characters.

Keywords: Convolvulaceae, *Stictocardia*, Queensland, Australia

R.W. Johnson, Queensland Herbarium, Environmental Protection Agency, Brisbane Botanic Gardens Mt Coot-tha, Mt Coot-tha Road, Toowong, Queensland, 4066, Australia

Introduction

The genus *Stictocardia* was described by Hallier (1893) to include three species, one of which was *Stictocardia tiliifolia* (Desr.) Hallier f. A few specimens of *S. tiliifolia* had been collected from the Rockhampton and Rockingham Bay regions of Queensland in the late 1880's when they were identified as *Ipomoea grandiflora* Lam. (Mueller, 1889; Bailey, 1901). It was not until Ooststroom (1943) that the transfer of this taxon to *Stictocardia* was recognised in Australia.

In 1928 Domin described *Argyreia queenslandica* from a flowering specimen he collected near Mungana in 1910. He ascribed the species to the genus *Argyreia*. At that time he recognised two other species of *Argyreia* as occurring in Australia. *A. soutteri* (F.M.Bailey) Domin, which he transferred from the genus *Lettsomia*, is now known only from the type collection and now presumed extinct, while *A. nervosa* (Burm.f.) Bojer, an introduced species, is widely naturalised in north Queensland.

In recent years, fruiting material of *Argyreia queenslandica* has been collected from the type locality and surrounding areas. The presence of minute black glands on the underside of the leaves and the enlarged calyx which completely encloses the fruit, clearly requires the transfer of this species to the genus *Stictocardia*.

Classification

Stictocardia is regarded as a member of the tribe Argyreieae (Hallier 1893; Austin & Demissew 1997). The only other members of this tribe in Australia are the introduced *Argyreia nervosa* and the enigmatic *A. soutteri*.

Taxonomy

Stictocardia Hallier f., in Engl. Bot. Jahrb. 18: 159 (1893); Ooststr., Blumea 5: 346, fig. 1, g–h (1943); Fl. Males., ser. 1, 4(4): 491 (1953). **Type**: *Stictocardia tiliifolia* (Desr.) Hallier f. ("tiliaefolia"), based on *Convolvulus tiliifolia* Desr. ("tiliaefolia").

Annual to woody perennial with trailing and twining stems. Cotyledons bilobed, with the lobes ovate-oblong, diverging and greatly exceeding the base. Leaves ovate or orbicular, mainly cordate at the base, the lower surface with many minute glands. Inflorescence axillary, cymose, 1–many flowered; bracts deciduous. Sepals 5, subequal, elliptic or orbicular, obtuse to emarginate, subcoriaceous, often with thinner margin, much accrescent in fruit. Corolla red or purple, large, funnel-shaped, the midpetaline bands often somewhat pilose outside or at the distal end and with minute glands like the leaves. Stamens and style included. Filaments inserted near the corolla base; pollen grains spheroidal and polypantoporate with a spinulose surface. Ovary glabrous, 4-celled, each cell with 1 ovule; style 1, stigma biglobular. Fruit much

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enclosed by the much-enlarged calyx, globular, dissepiments with 2 transverse wings at the surface of the fruit, dehiscing irregularly between the wings exposing 4 pubescent seeds.

***Distribution*:** *Stictocardia* is a pantropical genus of 10 species (Austin & Eich 2001). The species occur primarily in the tropics of Africa, Asia and Australia with only *S. tiliifolia* extending into tropical America as an introduction (Austin & Demissew 1997). *Stictocardia tiliifolia* has been recorded from tropical Australia (Johnson 1983), though Austin & Eich (2001) in their synopsis did not cite any records from Australia. A second species in the genus, described originally as *Argyreia queenslandica*, is endemic to north-eastern Australia.

***Etymology*:** The generic name is derived from the Greek, *stiktos* for dotted, and *kardia* for heart-shaped, referring to the broadly ovate, cordate leaves dotted with glands on the lower side, a feature characteristic of the genus.

Key to species of *Stictocardia* in Queensland

1. Outer sepals at flowering 1–1.5 cm long, to 2.5 cm at fruiting; petal segments 6–7.5 cm long .... **1. S. queenslandica**
2. Outer sepals at flowering 1.5–2.2 cm long, to 4.5 cm at fruiting; petal segments 8–10.5 cm long .... **2. S. tiliifolia**

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1. *Stictocardia queenslandica* (Domin) R.W.Johnson, **comb. nov.** *Argyreia queenslandica* Domin, Biblioth. Bot. 89: 1087 (1928). **Type:** Queensland: Nord-Queensland: am fusse eines Karsthugels bei Mungana, Domin II. 1910 (holo: PR; photo BRI).

Annual or perennial with trailing and twining stems; cotyledons deeply bi-lobed (**Fig. 1**); stems terete, herbaceous, sparsely hairy to ± glabrous, with short, spreading to ± appressed, tubercle-based hairs, 0.1–0.2 mm long. Leaves petiolate; petiole 2–15 cm long, slightly channelled above, hairy as for stem, 0.6–1.4 times as long as the blade; blade simple, broadly ovate, occasionally ovate- to oblong-elliptic, often shortly acuminate, 8–18 cm long, 6–15 cm wide with a L:W ratio of 1.1 to 1.4, apex narrowly obtuse, mucronate, base cordate often with an oblong sinus, 15–25% of the blade length, discolorous, darker green above, the underside covered with dark green to black glandular pits, sparsely hairy to ±glabrous, occasionally moderately hairy on both sides, hairs short, weakly erect to ascending, 0.1–0.2 mm long, midrib with 6–8 secondary veins per side. Inflorescence axillary, cymose, usually simple, occasionally compound, bearing 1–2, rarely 3 flowers, occasionally with 2 inflorescences per axil, often with glandular pits on peduncles, pedicels and sepals; peduncle terete, stout, 0.4–2.0 cm long, extending to 3.0 cm at fruiting, glabrous to very sparsely hairy; bracts opposite to sub-opposite, herbaceous, oblong, 2.5–4 mm long, 1–1.8 mm wide, apex rounded to barely acute, ciliate, face ± glabrous, with a raised midrib, abscissing when in bud or early flowering; pedicels terete, thicker than the peduncle, flattened and dilated and becoming angular upwards, 0.7–1.2 cm long, extending to 1.7 cm at fruiting, glabrous or with an occasional hair. Sepals concave, thick, ±fleshy, with a narrow hyaline margin, becoming leathery and enclosing the capsule at fruiting; outer sepals broadly ovate to ovate-orbicular, 1.0–1.5 cm long, 1.4–2.0 cm wide, expanding to 2.5 cm × 3.5 cm at fruiting, apex obtuse, base truncate to slightly cordate, glabrous except for some short marginal and ciliate hairs; inner sepals orbicular to ovate or oblong-orbicular, 1.2–1.6 cm long, 1.0–1.6 cm wide, expanding to 2.5 cm × 2.7 cm at fruiting (**Fig. 3A**), apex obtuse to rounded, emarginate, base ± rounded to truncate, glabrous. Corolla funnel-shaped, limb purple to reddish-purple with darker purple inner throat and midpetaline bands, 5.5–6.5 cm long, tube to base of flare 2.0–3.5 cm long, limb 4.5–6 cm diameter, tube at base of flare 0.9–1.3 cm diameter, glabrous except for a few hairs on the midpetaline band towards the limb and a fringe of slender, somewhat sinuate, ciliate hairs, 0.2–0.75 mm long, lining the rim each side of the midpetaline

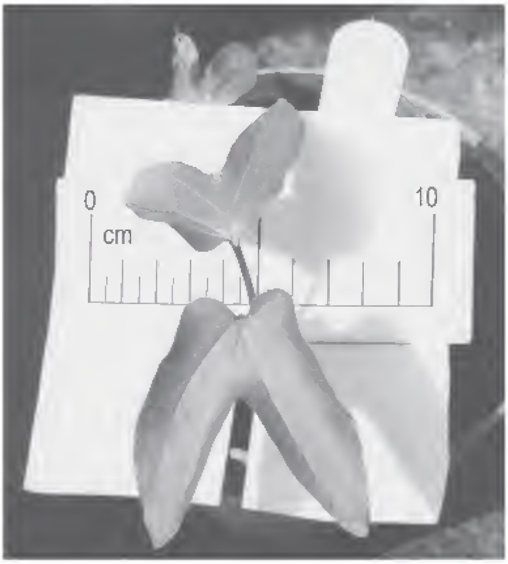

Fig. 1. Cotyledons of ***Stictocardia queenslandica*** from glasshouse specimen grown from *Clarkson* 3789.

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band; petal segments 6.0–7.5 cm long, 2.5–3.7 cm wide at the limb, distally rounded-triangular, sometimes emarginate. Stamens 5, fused for 9–12 mm from the base of the corolla tube, fused area not raised; filaments terete above, flattened and dilated downwards, unequal in length, 1.3–2.1 cm long, densely hairy from just below the point of insertion for 2–5 mm along the filament, hairs reddish-purple, cylindrical, sinuate with small clear club-shaped to cylindrical terminal cells, up to 1.25 mm long; anthers lanceolate, sagittate, 4.0–4.8 mm long, 1.2–1.6 mm wide, apex rounded to truncate, basal lobes rounded, 0.6–0.9 mm long, splitting lengthwise at maturity; pollen globular, spinulose. Ovary ovoid, constricted in the upper part, quadrangular in cross-section, glabrous, 4-celled, with 1 ovule per cell, disk prominent, donut-shaped, 5-lobed, 0.4–0.7 mm high, yellowish; style 2.5–3.0 cm long, unbranched, glabrous, bearing a capitate to almost 2-lobed stigma, 2.3–2.4 mm × 1.75–2.0 mm in cross-section, with laterally compressed conical tubercles bearing short hair-like protuberances. Capsule ovoid to depressed globular-ovoid, rounded-quadrangular in cross section, with thin papery walls, 1.0–1.5 cm high, 1.0–1.7 cm diameter, glabrous, 4-celled, septa persistent at maturity with distal, transverse wings, irregularly dehiscing longitudinally between the wings. Seeds 4, ¼-globular-ovoid, olive-brown to black, 7.5–9 mm long, 6 –8 mm wide, moderately to densely pubescent, with short erect to ascending golden brown hairs, 0.1–0.2 mm long somewhat matted, with longer hairs to 1 mm densely clustered on the inner margin of the hilum.

***Specimens examined*:** **Queensland.** COOK DISTRICT: 16km E of Rookwood Creek, c. 16km W of Chillagoe, Mar 1980, *Clarkson* 3025 (BRI); c. 1km towards Chillagoe from Mungana railway siding, Jun 1981, Clarkson 3789 (BRI); Royal Arch Tower, c. 5km SW of Chillagoe, Mar 1987, *Clarkson* 6837 & *McDonald* (BRI, MBA, QRS, K); The Archways, c. 15km NW of Chillagoe, May 1987, *Clarkson* 6860 & *McDonald* (BRI, MBA); 2km SE of Rookwood Homestead, c. 6km NW of Mungana, Jun 1983, *Conn* & *De Campo* 1347 (MEL, BRI, MBA); NPR 98, Royal Archway Cave, Mungana, Apr 2000, *Ford* 02382 (QRS, BRI); Wrotham Park – Mungana road, 8km NW of Mungana, Apr 1980, *Johnson* 4043 (BRI).

***Distribution and habitat*:** It is endemic to Australia and is restricted to a small area in the Chillagoe–Mungana area (**Map 1**). It appears to be confined to limestone outcrops and grows in deciduous vine thickets.

***Phenology*:** Flowers have been recorded from March to June with fruiting occurring soon after flowering. Fruit have been recorded from April to November.

***Etymology*:** The specific epithet refers to Queensland, the state of Australia in which it was discovered.

***Notes*:** It resembles *Stictocardia discolor* Ooststr., based on the description given by Ooststroom (1943), which is known only from one collection from Timor. Both *S. queenslandica* and *S. discolor* have shorter sepals and corollas than *S. tiliifolia*. However *S. discolor* appears to have shorter sepals and longer and more slender peduncles and pedicels than *S. queenslandica.* In addition, *S. discolor* is characterised by a red coloration on the lower leaf surface.

***Conservation status*:** This species is listed as Rare under Queensland Government legislation.

2. Stictocardia tiliifolia (Desr.) Hallier f., Bot. Jahrb. 18: 159 (1893) (“tiliaefolia”); Ooststr. Blumea 5: 346. (1943); Ooststr. Fl. Males. ser. 1, 4: 491. (1953); *Rivea tiliaefolia* (Desr.) Choisy, Mem. Soc. Phys. Geneve 6: 407 (1834); *Argyreia tiliaefolia* (Desr.) Wight, Icones Pl. Ind. Or. 4(2): 12 t. 1358. (1848); *Convolvulus tiliaefolius* Desr., in Lam. Encycl. Meth., Bot 3: 544 (1792). **Type:** Mauritius, Commerson (P, not seen).

Ipomoea grandiflora Lam., Tabl. Encycl. I: 467 (1791).

Woody perennial liana with twining stems; stems terete, herbaceous, moderately hairy with short, weakly ascending, tubercle-based hairs, 0.1–0.4 mm long, becoming woody, reddish-purple in colour, distinctly lenticular and glabrous at the base. Leaves petiolate; petiole 2.5–10 cm long, slightly channelled in the upper half, hairy as for the stem, 0.3–0.9 times as long as the blade; blade simple, broadly ovate to ovate-oblong to almost orbicular, often shortly and abruptly acuminate, (6–) 8–18 cm long, 6–14 cm wide with a L:W ratio of 0.9–1.4, apex acute, occasionally rounded to emarginate, mucronate, base cordate with a broad rounded sinus, 15–27% of the blade length, discolorous, darker green above, the underside covered with dark green to black glandular pits, moderately to sparsely hairy on both sides, hairs short, erect to ascending, 0.1–0.4 mm long, midrib with 6–9 secondary veins per side. Inflorescence axillary, cymose, usually simple, occasionally compound, bearing 1, rarely 2 or 3 flowers, often with glandular pits on peduncles, pedicels and sepals; peduncle terete, stout, 1.5–6.5 cm long, moderately hairy with short sinuate, erect to ascending matted hairs, 0.1–0.4 mm long,; bracts opposite to subopposite, herbaceous, oblong, concave, 4.5–8 mm long, 2.8–4 mm wide, apex rounded, emarginate, mucronulate, sparsely to moderately hairy, occasionally ± glabrous, abscissing when in bud or early flowering; pedicels terete, stout, slightly dilated and angular upwards, 1.0–2.0 cm long, moderately hairy, glabrescent. Sepals concave, thick, ±fleshy, with a narrow hyaline margin, becoming leathery with distinct longitudinal and reticulate venation and enclosing the capsule at fruiting; outer sepals broadly ovate to orbicular or ± reniform, 1.5–2.0 (–2.2) cm long, 2.0–2.5 cm wide, expanding to 4.5 cm × 5 cm at fruiting (**Fig. 3B.**), apex rounded, ± emarginate, base rounded to shallowly cordate, moderately to sparsely hairy, glabrescent; inner sepals broadly elliptic to orbicular or obovate-orbicular, slightly smaller than the outer, 1.3–1.8 (–2.0) cm long and wide at flowering and expanding at fruiting, apex rounded, emarginate, base ± rounded to truncate, glabrous. Corolla funnel-shaped, limb purple with darker violet-purple inner throat and midpetaline bands, (6.5–) 7.0–8.5 cm long, tube to base of flare 3–4 cm long, limb 6–9 cm diameter, tube at base of flare 1.5–2 cm diameter, ± glabrous or with scattered hairs on the midpetaline band towards the tip and a fringe of slender, somewhat sinuate, ciliate hairs 0.2–0.75 mm long lining the rim each side of the midpetaline band; petal segments 7.5–10.5 cm long, 3.5–5 cm wide at the limb, distally rounded, emarginate. Stamens 5, fused for 10–13 mm from the base of the corolla tube, fused area not raised; filaments terete above, slightly flattened and dilated downwards, unequal in length, (2.7–) 3.5–4.5 cm long, densely hairy from about the point of insertion for 4–8 mm along the filament, hairs reddish-purple, dense, cylindrical, sinuate with short, clear, globular to club-shaped terminal cells, to 1.2 mm long; anthers lanceolate, sagittate, 5.0–6.5 mm long, 1.7–2.5 mm wide, apex rounded, bluntly apiculate, basal lobes rounded, 1.0–1.4 mm long, splitting lengthwise at maturity; pollen globular, spinulose (**Fig. 2.**). Ovary ovoid, constricted in the upper part, rounded quadrangular in cross-section, glabrous, 4-celled with 1 ovule per cell, disk prominent, donut-shaped, 5-lobed, 0.6–1.0 mm high, golden-yellow; style 4.0–5.7 cm long, unbranched, glabrous, bearing a bi-globular stigma, 2.5–3.0 mm × 1.5–1.8 mm in cross-section, covered in distinct tubercles bearing short hair-like protuberances. Capsule ovoid, rounded-quadrangular in cross section, 1.5–2 cm high, 1.6–2 cm diameter, glabrous, 4 celled, septa persistent at maturity with distal, transverse wings, irregularly dehiscing longitudinally between the wings. Seeds 4, ¼-globular-ovoid, 8–11 mm long and 6–8 mm wide, brown, densely pubescent with short erect to ascending brown hairs, 0.1–0.2 mm long, somewhat matted with longer hairs to 1 mm densely clustered around the hilum.

***Selected specimens examined*:** **Northern Territory**. Darwin and Gulf Region: Goromuru River, c. 7 km SE of mouth, 27 Apr 1996, *Cowie* 6659 & *Bokarra* (DNA, BRI); Arafura Swamp area near Raminging, Sep 1998, *Cowie & Mangion* 7963 (DNA, BRI); Arnhem Land, Bennet Bay, Nov 1987 *Dunlop* 7350 (DNA, BRI); 9 km SW of West Alligator Head, Kakadu, Jun 1988, *Russell-Smith* 5612 & *Lucas*. (DNA, BRI); 11 km E Channel Point, Nov 1988, *Russell-Smith* 6406 & (BRI, DNA). **Queensland.** Cook District: Low Isles, May 1963, *Cribb* BRIU2839 (BRI). North Kennedy District: Mount Bertha, Gloucester Island, 21 Mar 1994, *Batianoff* 9403318 & *Dillewaard* (BRI); nr Port Denison, 1887, *Birch* s.n. (MEL 95501); Cromarty, Mar 1935, *Blake* 8318 (BRI); Rockingham Bay, s.d., *Dallachy*, (MEL95476); Ayr, s.d., *Michael* 1526 (BRI); Harvey Range, Oct 1929, *Pollock* s.n. (BRI); Long Island, Jul 1935, *White* 12157 (BRI). Port Curtis District: Howard Point, Middle Percy Island, Oct 1989, *Batianoff* 11706, *Champion, Thompson & Dillewaard* (BRI); Rockhampton, s.d., *Dietrich* (MEL 95502). Moreton District: Burleigh Heads, Mt Burleigh National Park, 1972, *Catherine* (BRI).

***Distribution and habitat*:** It is widespread throughout the old world tropics from central and southern Africa through south-east Asia to Australia and islands in the west Pacific Ocean and is naturalised in tropical America. It has been recorded along the coast of northern and north-eastern Australia from east of Darwin to Burleigh Heads, SE of Brisbane (**Map 1**). It grows mainly in coastal vine forests; occasionally in coastal eucalypt open forests.

***Phenology*:** Flowers have been recorded from March to July and fruit from July to November.

***Etymology*:** The specific epithet refers to the shape of the leaves which resemble those of the Linden or lime tree (*Tilia* spp.)

***Conservation status*:** This species is currently not considered to be rare or endangered.

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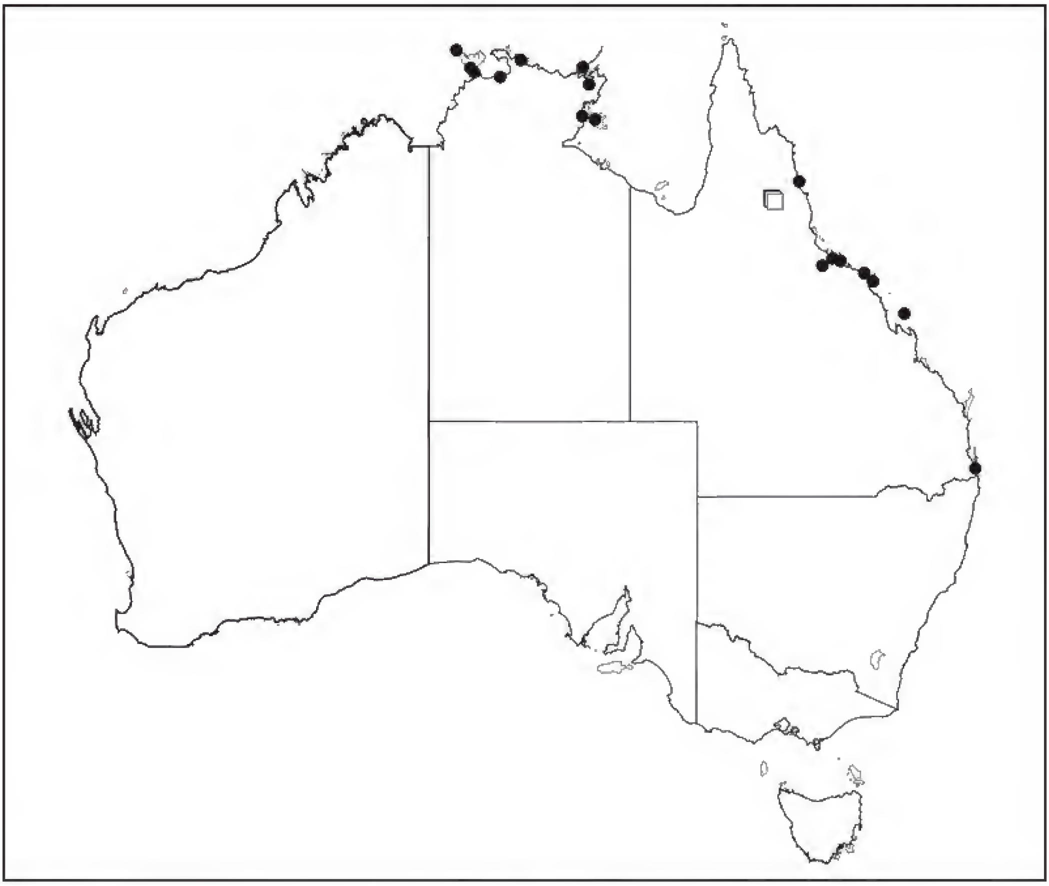

Map 1. Distribution of □ *Stictocardia queenslandica* and ● *S. tiliifolia.*

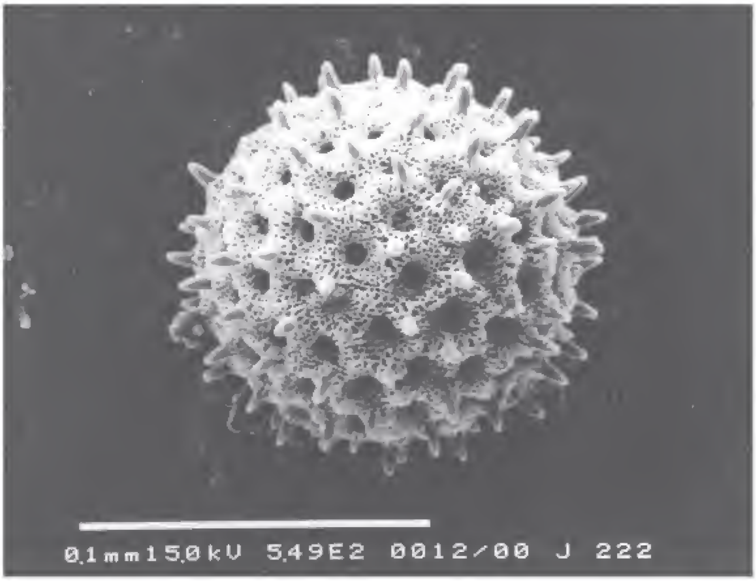
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Fig. 2. Pollen grain of ***Stictocardia tiliifolia*** from *Dunlop* 2782 (AD).

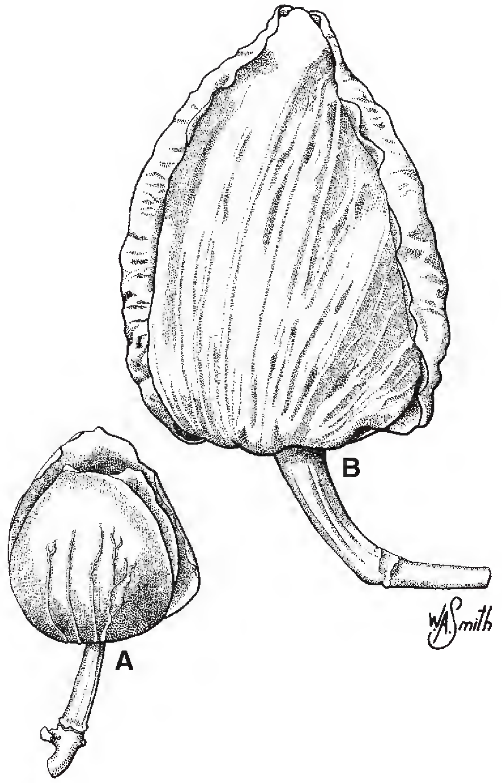

Fig. 3. Fruiting calyx of A. ***Stictocardia queenslandica*** - (glasshouse specimen (*Calway* BRI-AQ378863), grown from seed of *Clarkson* 3789 × 1.5) and B. ***S. tiliifolia*** – (*Pollock* s.n. (BRI-AQ 277029) × 1.5)

The taxonomy and ecology of *Solanum* subg. *Leptostemonum* (Dunal) Bitter (Solanaceae) in Queensland and far north-eastern New South Wales, Australia

A.R. Bean

Summary

Bean, A.R. (2004), The taxonomy and ecology of *Solanum* subg. *Leptostemonum* (Dunal) Bitter (Solanaceae) in Queensland and far north-eastern New South Wales, Australia. *Austrobaileya* 6(4): 639–816. 90 species (82 indigenous and 8 naturalised) of *Solanum* subg. *Leptostemonum* are recorded for Queensland and far north-eastern New South Wales (north of 29°S latitude), with 50 species endemic. 29 species and one subspecies are described as new and illustrated (*S. ammophilum, S. argopetalum, S. cocosoides, S. crebrispinum, S. ditrichum, S. dryanderense, S. dumicola, S. dysprosium, S. eminens, S. fervens, S. francisii, S. galbinum, S. graniticum, S. hapalum, S. innoxium, S. intonsum, S. johnsonianum, S. jucundum, S. latens, S. longissimum, S. lythrocarpum, S. mentiens, S. parvifolium* subsp. *tropicum, S. pusillum, S. rixosum, S. senticosum, S. stenopterum, S. ultimum, S. versicolor and S. vicinum*); six species are reinstated (*S. angustum* Domin, *S. crassitomentosum* Domin, *S. defensum* F.Muell., *S. magnifolium* F.Muell., *S. mitchellianum* Domin and *S. shirleyanum* Domin) and three are reduced to synonymy (*S. cleistogamum* Symon, *S. dallachii* Benth. and *S. seitheae* Symon). *S. dianthophorum* Dunal is accepted, but known only from the holotype. *S. centrale* and *S. yirrkalense* are newly recorded as native to Queensland, and *S. incanum* is newly recorded as naturalised. Lectotypes are chosen for *S. defensum* and *S. dunalianum*, and a replacement lectotype chosen for *S. sturtianum*. All Australian species are classified into (mostly pre-existing) informal taxonomic groups. Distribution maps and notes on distribution are given for all taxa. Other biogeographical data (based on degrees of latitude and longitude) are provided, both at species and group level. Indumentum characters (particularly those of the stellate hairs) have been used extensively to elucidate the taxonomy of the group. Ecological requirements of various *Solanum* species and the reasons for their infrequent or transient occurrence are discussed. The use of *Solanum* fruits as food is reviewed. Identification keys (dichotomous and multi-access) are provided for all Queensland species. The conservation status of all indigenous taxa is assessed.

Keywords: *Solanum*, *Solanum* subg. *Leptostemonum*, new species, taxonomy, ecology, biogeography, conservation status, Queensland, New South Wales, Australia, keys, DELTA, identification, indumentum, stellate hairs.

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Introduction

Solanum is the fourth largest Angiosperm genus in the Queensland flora. An interrogation of the Queensland Herbarium database in July 2003 returned 73 accepted and formally named indigenous *Solanum* species. Only *Acacia* (305 spp.), *Eucalyptus* (188 spp.), and *Cyperus* (112 spp.), had more species.

Five subgenera of *Solanum* (using the classification of D'Arcy (1972)) are represented in Queensland, either as natives or naturalisations:

S. subg. *Archaesolanum* - the 'Kangaroo Apples', quick growing shrubs without stellate hairs or prickles, leaves often deeply lobed (*S. aviculare, S. vescum*);

S. subg. *Brevantherum* - comprising the 'Wild Tobaccos', large shrubs with stellate hairs and corymbose inflorescences (*S. mauritianum, S. erianthum, S. abutiloides*);

S. subg. *Leptostemonum* - the subject of this paper, and comprising the majority of taxa;

S. subg. *Potatoe* - the 'Potato Creepers', vines with deeply lobed leaves (*S. laxum, S. seaforthianum, S. triflorum*);

S. subg. *Solanum* - comprising the 'Blackberry Nightshades' or 'Black Nightshades', small shrubs with umbel-like inflorescences (*S. americanum, S. chenopodioides, S. nigrum, S. opacum, S. physalifolium, S. villosum*), and two species from *S.* sect. *Geminata* (Knapp

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2002) - *S. spirale*, a tall rainforest shrub with globose or ellipsoidal orange fruits, and the small shrub *S. pseudocapsicum* (Jerusalem Cherry).

Solanum subg. *Leptostemonum* consists of about 500 species distributed throughout the warmer parts of the world, but with centres of diversity in the South American tropics and subtropics, central east Africa, New Guinea and Australia. Distinguishing morphological characters for the subgenus include the attenuate anthers, stellate indumentum, and the presence of prickles (Whalen 1984). They may be briefly described as the "prickly" *Solanum* species. The few species that lack prickles invariably possess stellate indumentum, and the few species that lack stellate indumentum invariably possess prickles.

Significant contributions to the taxonomy and knowledge of Queensland members of the subgenus have been made by Brown (1810), Mueller (1861), Bentham (1868), Domin (1929), Symon (1971, 1981, 1995), Ross (1986) and Bean (2001, 2002b).

A reappraisal of Queensland species is necessary for several reasons. Some previously synonymised species (particularly those described by Karel Domin) deserve to be re-instated; additional taxa have been discovered or recognised; extra information on distribution, morphology or ecology has become available for many species; and some nomenclatural changes are necessary. The inclusion of a small portion of New South Wales (north of 29° S) in this study means that the biogeographic data are more meaningful.

The ensuing discussion relates entirely to the members of *S.* subg. *Leptostemonum* occurring in Queensland and far northeastern New South Wales.

Morphology and terminology

***Habit*:** Habit varies from completely prostrate shrubs to small trees attaining 9 metres in height (*S. viridifolium*). Most are shrubs 0.5–1.5 metres high. Habit is discussed further in the Ecology section below.

***Juvenile plants*:** These are plants that have not yet reached reproductive age, or are bearing their first flowers. Their leaves are called juvenile leaves. The juvenile leaves are generally larger, pricklier and more deeply lobed than those occurring on adult (flowering and fruiting) plants. The stems of juvenile plants of any given species are usually more densely prickly than on adult plants. Juvenile growth may also be found on vigorous shoots arising from the lower parts of sexually mature plants, or the shoots arising from a cut stem. For species exceeding 1 metre in height at maturity, juvenile characters have been assessed, where possible, on plants 20–30 cm high. For smaller species, particularly the herbaceous resprouters, the juvenile stage is either absent or of very short duration, and hence is only rarely described.

***Sympodia*:** Each inflorescence in *Solanum* is developmentally terminal, but is quickly exceeded by subsequent vegetative growth (Child 1979). Each lateral vegetative shoot is termed a sympodial unit. The sympodia are usually difoliate *i.e.* there are two leaves between successive inflorescences. These leaves may arise from the same position on the stem (geminate) or not (disjunct).

***Bark*:** In most species, the bark is unremarkable and rather non-descript. It is smooth, green to dark brown, and often bears raised lenticels. However, in two species (*S. furfuraceum* and *S. sporadotrichum*), the bark is conspicuously furrowed and corky, especially on the large stems. In these species, corky outgrowths are usually visible even on (the thicker stems of) herbarium specimens. Corky stems (less obvious than the above) are also found on *S. versicolor*, *S. francisii* and *S. crassitomentosum*.

***Large stems*:** Those more than 30 cm from the growing point, and including the trunks of small trees.

***Branchlets*:** Stems less than 30 cm from the growing point (*i.e.* those usually present on herbarium specimens). In most species, they appear to the naked eye smooth and terete, but in a few species (notably *S. quadriloculatum*), they are conspicuously ridged.

Adult leaves: Leaves that are found adjacent to, or distal from, the inflorescences. Many species have entire adult leaves, but in others, the adult leaves are variously lobed. A "lobing index" is used in this paper, which is the length of the lobe halfway along the lamina divided by the parallel length of the adjacent sinus (f/e in **Fig. 1**). The index is 1 for an entire leaf; leaves with an index >2 are considered to be deeply lobed. While the leaf size of a species can vary considerably depending on prevailing environmental conditions, the lobing index is relatively constant. In a few species, leaves can be pseudo-pinnate (derived from deeply lobed leaves where the proximal lobes are divided right to the midrib).

At least some of the adult leaves of all Queensland *Solanum* species are bilaterally asymmetrical, and this is manifested most conspicuously at the lamina base. In this paper, such a leaf base is described as oblique. Obliqueness is given both in absolute terms (the length "b" on **Fig. 1**) and as a percentage of lamina length (100 × b/(a+b) on **Fig. 1**). Petiole length is measured in absolute terms (the length "c" on Fig. 1) and as a percentage of lamina length (100 × c/(a+b) on **Fig. 1**). Both are useful for discriminating some taxa. In a few species, the petioles are winged, the wings consisting of a narrow strip of green tissue on either side of the petiole throughout its length.

***Inflorescence*:** *Solanum* inflorescences are ebracteate scorpioid cymes, but often appearing racemose, with a single axis bearing several pedicellate flowers. A few species (*e.g. S. chrysotrichum*) have a much-branched inflorescence, resembling a panicle. In some species, particularly those allied to *S. densevestitum*, the inflorescence comprises a single flower, or sometimes 2–3 flowers all arising from the branchlet without any common peduncle (pseudo-umbellate). The 'racemose' inflorescence may also lack a common peduncle, with the basal flower emerging very close to the branchlet, and subsequent flowers borne on a rachis.

***Sex expression*:** Many species are andromonoecious, that is, their inflorescences comprise some bisexual flowers (towards the base) and some male flowers, where the style is much reduced in length and is non-functional (Whalen 1984). A style can be inferred to be functional when it protrudes beyond the top of the anthers. Another large group of species bear only bisexual flowers. One Queensland species (*S. carduiforme*) is dioecious (Symon 1981).

***Flowers*:** *Solanum* flowers are largely pentamerous, but tetramery (where there are 4 calyx lobes, four corolla lobes and four stamens) is found in several groups or species. For most species, only occasional tetramerous flowers occur, but in some species (*e.g. S. viridifolium*) approximately half of the flowers are tetramerous, while in a few species (*e.g. S. ammophilum*) all flowers appear to be tetramerous.

The calyx comprises a fused basal section or "tube", and free lobes. The calyx tube is somewhat invariate in shape, but the shape of the calyx lobes is often somewhat diagnostic. The calyx invariably grows between anthesis and fruiting, but in many species this growth is minimal and the lobes fail to extend to half the length of the mature fruit (not accrescent). In other species, either the calyx lobes grow until they extend beyond the fruit, or the calyx tube grows to completely envelop the mature fruit (accrescent).

Prickliness of the calyx is correlated with both sex expression and accrescence. In some Queensland species (mostly naturalised species such as *S. linnaeanum*, but also *S. stupefactum*), the calyx of the basal bisexual flowers is much more prickly than that of the distal male flowers. In species with a strongly accrescent calyx, the calyx is always prickly.

The pedicels generally lengthen between anthesis and fruit maturation, and hence measurements are provided for both stages.

Corolla shape, size, and sometimes colour, are useful in identifying *Solanum* species. The shape is dependent on the amount of "interpetalar" tissue present (the tissue connecting the individual lobes of the corolla). Species with little or no interpetalar tissue have deeply lobed corollas; species with abundant interpetalar tissue have rotate or pentagonal corollas. In most Queensland species, the corolla is mauve to purple, but in a few it is white, while one naturalised species (*S. rostratum*) has a yellow corolla. All

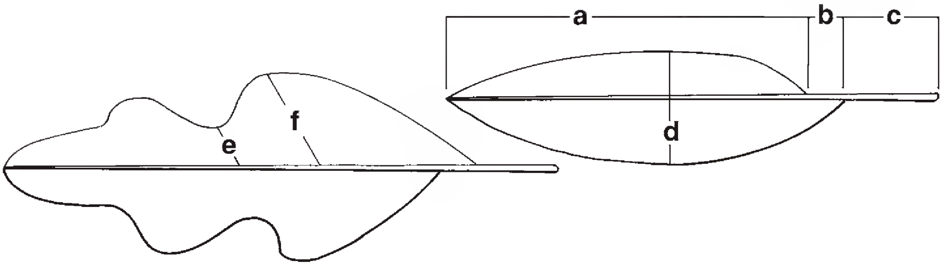

Fig. 1. Diagrammatic representation of leaves showing the measurements used.

Queensland species (except *S. pugiunculiferum*) have stellate hairs on the outer surface of the corolla, but relatively few have hairs on the inner surface, and hence this character is useful.

Each stamen comprises a short filament and a relatively long, attenuate, yellow anther. The anthers are very similar throughout the subgenus, although anther length can be diagnostic. The style is most often erect, emerging between the stamens, but some species have a sigmoid or eccentric style that is strongly bent just above the ovary, so that it does not touch the anthers at all. The stigma is for most species unremarkable, being entire or obscurely lobed. However, in a few species belonging to the *S. dioicum* group, the stigma is conspicuously forked, with each fork up to 5 mm long. The ovary is a rather uniform structure, but the indumentum pattern on the surface is very useful.

***Fruits and seeds*:** Mature fruits are very valuable for species identification and classification (Nee 1986; Symon 1987). Each species has a characteristic fruit size, shape, colour, exocarp thickness and placentation pattern, and related species usually have similar fruit characteristics. Unfortunately, dried fruits preserved on herbarium specimens are totally unsuitable for determining most of the characters mentioned, even colour. Collectors rarely mention fruit colour, and when they do, there is no guarantee that the fruits they observed were mature. Hence fresh fruits or fruits preserved in alcohol and good collector's notes are essential for the accurate assessment of fruiting characters. Such collections are very infrequent, and much is still to be learned.

Fruit maturity is indicated in the field either by a distinct colour change (usually from green to red), or by their becoming relatively soft and easily detached from the plant.

About 21 of the Queensland species (belonging to Groups 5, 9A & 13) have bright red succulent fruits with a thin exocarp, *e.g. S. stelligerum.* The three species of Group 13A similarly have succulent fruits with a thin exocarp, but are black in colour. All these species have inflorescences in which usually all flowers are bisexual. Many other species (of Groups 22–28) have fruits with a thicker exocarp that remain pale green (often with some darker green variegation) at maturity, or sometimes becoming greenish-white or pale yellow. This fruit type is correlated with a weakly or strongly andromonoecious inflorescence. A small number of species have fruits which do not fit either of these types *e.g. S. vicinum* has a large deep-purple fruit about the size of a plum; *S. stupefactum* has a bright-orange hairy fruit.

Fruit shape is globular for most species, but distinctly oblate for *S. echinatum*, and distinctly ellipsoidal for *S. innoxium* and *S. gympiense*.

Placentation is a character that varies widely between species (Nee 1986). The "standard" placentation pattern for Solanaceae is a 2-locular fruit with axile placentas, but many Queensland taxa have 1-locular fruits, and a few have 3- or 4-locular fruits. The degree of development of the placenta also varies greatly.

Seed morphology is rather similar throughout, and all species have seeds that are

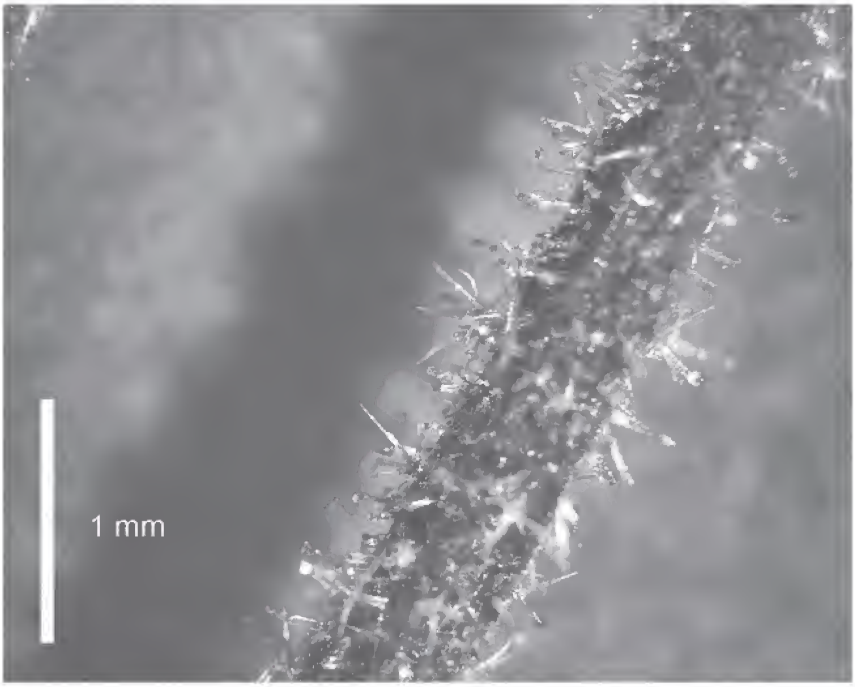

Fig. 2. Pedicel of ***S. torvum***, showing mixture of gland-tipped finger hairs and stellate hairs (Wilson GWW123)

lenticular and orbicular to somewhat reniform in outline. Differences in colour are useful in discriminating some species. Most species have pale (white to pale yellow) seeds, but a few species have quite dark seeds (brown to black).

***Trichomes*:** Trichome morphology is extremely useful in *Solanum* taxonomy (Roe 1971; Seithe 1979; Whalen *et al.* 1981; Seithe & Sullivan 1990), but has been only superficially utilised by taxonomists dealing with Australian species.

Comprehensive trichome descriptions are provided in this paper, as trichomes have proven to be consistent in form and size for each plant part for each species, and hence exceedingly useful for distinguishing taxa.

There is often a bewildering array of trichome constructions present on a single species. For example, the pattern observed on the branchlets is usually different from that observed on the upper leaf surface, and that pattern is different from that of the lower leaf surface etc. Hence, for the comparisons to be useful, indumentum must be described separately for each plant part. In this paper, five plant parts have been chosen for which indumentum is described in detail: branchlets, leaf upper surface, leaf lower surface, pedicel/calyx, and ovary/style.

Some trichome terminology follows Roe (1971). The trichome types used here are adapted from Seithe (1979), who recognised several kinds of trichomes, belonging to two distinct classes. **Type 1 hairs** include Finger hairs and all forms of Stellate hairs, while **Type 2 hairs** are very short gland-tipped trichomes, relatively uniform in appearance (see below).

1. Finger hairs (Seithe 1979; Seithe & Anderson 1982) - uniseriate unbranched hairs consisting of more than one cell, and usually 0.5–5 mm long. This hair type is found on several Queensland species (**Fig. 2, 3**).

Seithe (1979) has shown that they are ontologically related to stellate hairs, and that the latter are derived from finger hairs. In a few Queensland species, the developmental process can be observed directly *e.g.* finger hairs with tiny protuberances near the base; or stellate hairs with very short lateral rays and very long

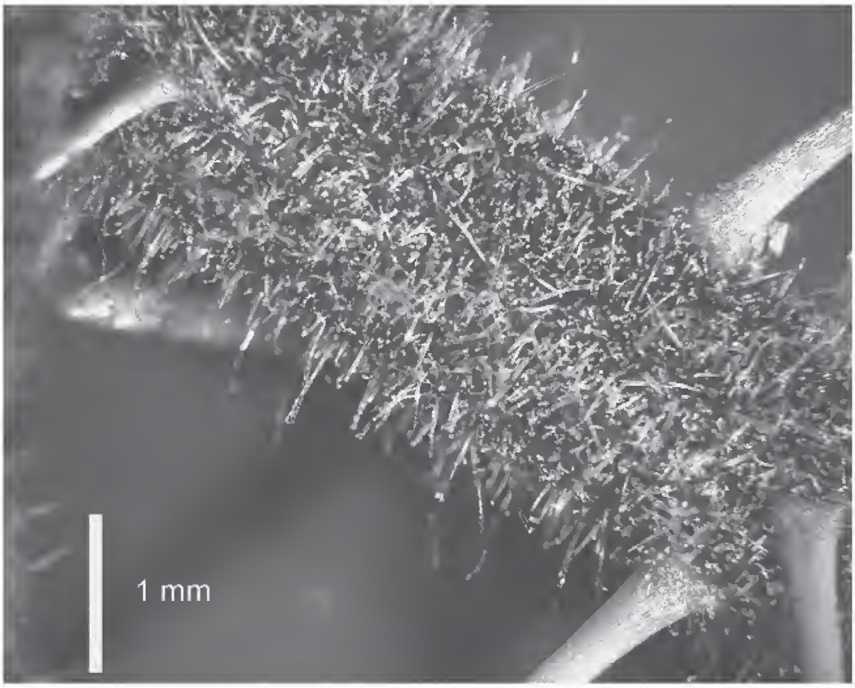

Fig. 3. Branchlet of ***S. ditrichum***, showing abundant finger hairs (Forster 11564 & Leiper)

central ray. In other species, finger hairs may be present as 'protostellae' (see below). However in most cases, the finger and stellate hair types are readily distinguishable. The finger hairs may have a unicellular glandular tip.

2. *Stellate hairs* (Roe 1971; Seithe 1979) - made up of a multiseriate stalk (sometimes obscure or absent) bearing varying numbers of unicellular, acicular lateral rays and (usually) with an erect uniseriate central ray or midpoint (Whalen 1984) (**Fig. 2, 4–10**).

Stellate hairs are a feature of nearly all species in the subgenus (and the subgenus comprises the majority of *Solanum* species in Australia). The morphological characteristics of stellate hairs (size, form, colour, density, number of lateral rays, and relative length of central ray) are all very useful for taxonomic purposes, in that the indumentum pattern for each plant part within a species has proven to be remarkably consistent.

(a) Developmental forms of stellate hairs

In many species, all hairs growing adjacent to each other are more or less the same size and shape. In other species, it appears that the development of the stellate indumentum of the leaves (and probably other organs) "switches off" before all the hairs have reached optimum development, resulting in stellae of differing sizes and developments being found in close proximity. In this paper, stellate hairs that have not reached their optimum development are termed "protostellae". These protostellae are smaller in size than ordinary stellae, and have fewer lateral rays, and they are interspersed with the ordinary stellae (**Fig 5, 10**). Protostellae are usually mentioned only for the upper leaf surface, though they may be present on other parts of the plant.

(b) Diameter

The average width of the stellate hair projected at right angles to the subtending surface.

The absolute distance between stellae is measured from centre to centre.

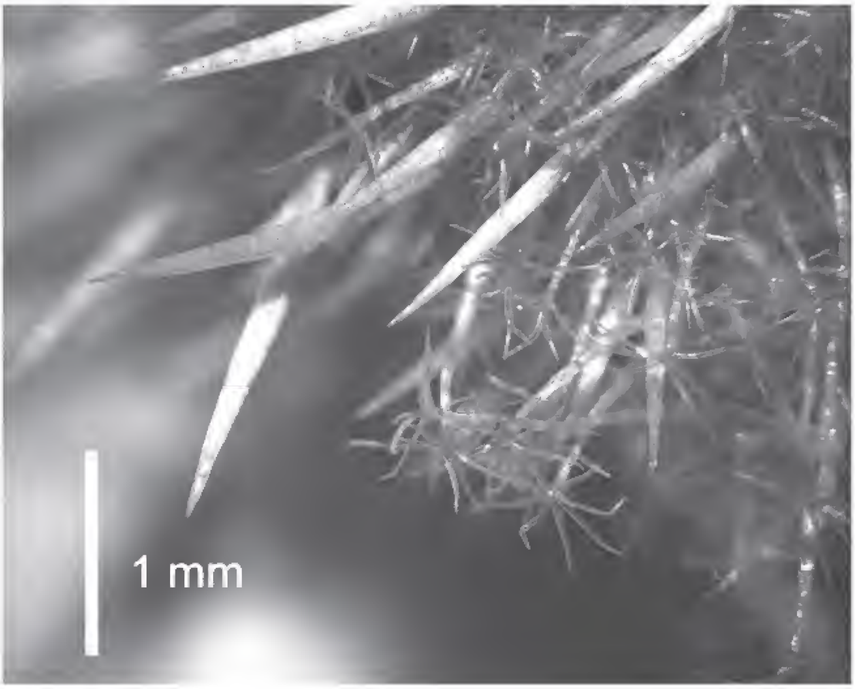

Fig. 4. Calyx of ***S. longissimum***, showing developing prickles with complete stellate hair at the apex (Bean 5617 & Forster)

(c) Density

Leaf indumentum density is measured on fully expanded adult leaves. In the species descriptions, the following terminology is used for stellate hair density:

very dense - ordinary stellae overlapping, multi-layered, the subtending surface not visible with hand lens (**Fig. 8**);

dense - ordinary stellae overlapping, 0.1–0.5 diameter apart (centre to centre), 1 or 2 layers only, the subtending surface visible with hand lens;

moderate - ordinary stellae just overlapping, 0.5–1 diameter apart (centre to centre) (**Fig. 7**);

sparse - ordinary stellae 1–2 diameters apart (centre to centre) (**Fig. 5**);

very sparse - ordinary stellae > 2 diameters apart (centre to centre) (**Fig. 10**).

Hence for "very dense", "dense" and "moderate", the stellae are overlapping; for "sparse" and "very sparse", they do not touch each other.

Stellate hair density is certainly quite variable for a species. Observations in the field and herbarium show that relatively large leaves that have developed under mesic conditions tend to have more widely spaced hairs than on small leaves developed under xeric conditions. It is hypothesised that the number of stellate hairs per leaf is fixed for each genotype, and that density is determined by environmental conditions.

(d) Orientation of lateral rays

If the lateral rays of the stellate hair are all in one plane, like the spokes of a wheel, they are described as "porrect" (Roe 1971) (**Fig. 4, 6–10**). Sometimes the lateral rays are all placed at 30–60 degrees from the central ray. In this case, the lateral rays (usually 8 or fewer) are described here as "ascending" (**Fig. 5**). If the lateral rays (usually 8–16) are placed at various angles with respect to the central ray, the hair is described as "multiradiate" (Roe 1971).

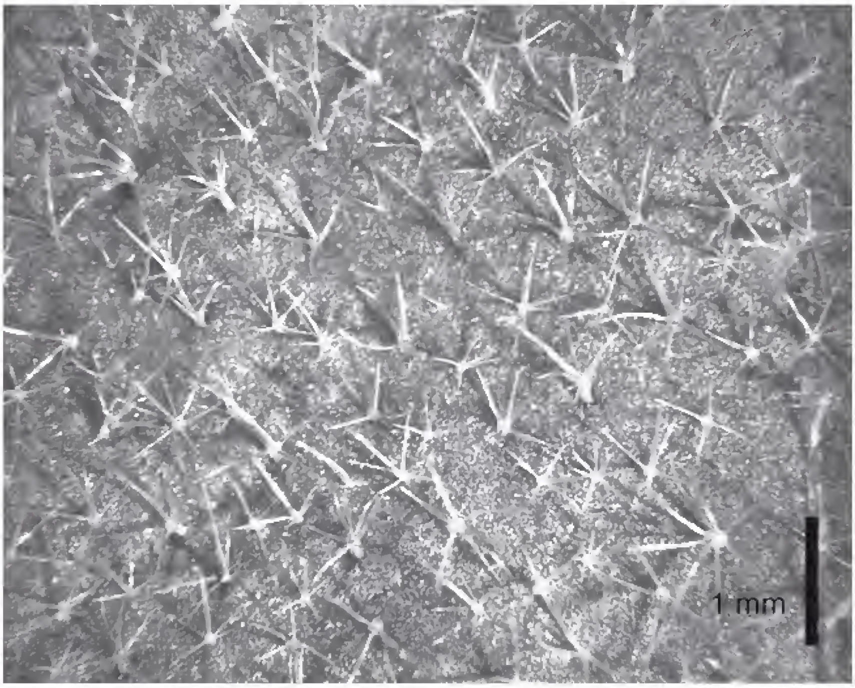

Fig. 5. Stellate hair pattern on the upper leaf surface of ***S. furfuraceum***, showing ascending lateral rays (Bean 15928)

(e) Central ray

The ratio of the central ray length compared to the average lateral ray length is reported. In some species, the central ray of the stellate hair possesses a unicellular glandular tip (Seithe 1979) (**Fig. 3**).

(f) Stalk length

Often, stellate hairs are sessile, *i.e.* there is no stalk below the lateral rays. In all other cases, the stalk length is reported.

Summary of stellate hair patterns observed in Queensland species

***a) Relative diameter*:** In general, stellae from the upper leaf surface have a smaller diameter than elsewhere on the plant. Those from the lower leaf surface, branchlets, calyx and style are usually about the same size.

***b) Absolute diameter*:** The broadest stellae are possessed by *S. densevestitum* (up to 1.8 mm across). Other species with very broad stellae are *S. crebrispinum, S. quadriloculatum, S. stenopterum, S. chippendalei* and *S. stupefactum*. Species with the smallest stellae include *S. corifolium, S. mentiens, S. francisii, S. macoorai, S. elachophyllum* and *S. sturtianum*, whose stellae are frequently less than 0.2 mm across.

***c) Lateral rays*:** Many species have 8, 7 or 8, or 6–8 lateral rays on each stellate hair. Some species have many more lateral rays. *S. elaeagnifolium* branchlet stellae have 15–18 lateral rays. Other species with 13 or more lateral rays are *S. ammophilum, S. cinereum, S. dianthophorum, S. dryanderense, S. elachophyllum, S. oligacanthum, S. sturtianum* (**Fig. 8**) and *S. yirrkalense*. Species with very few lateral rays include *S. cookii, S. coracinum, S. densevestitum, S. dumicola, S. francisii, S. latens, S. pusillum* and *S. rostratum*.

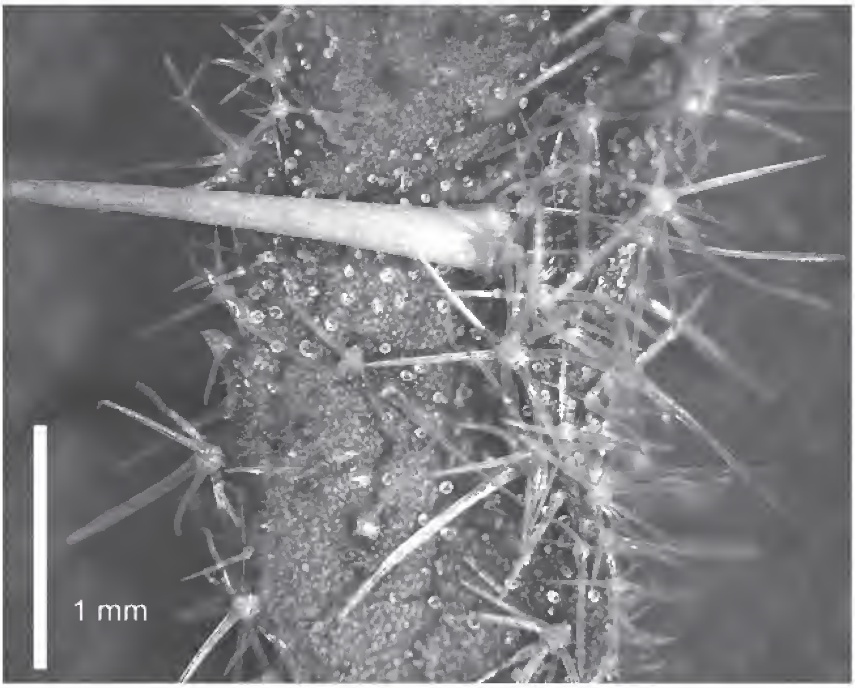

Fig. 6. Upper leaf surface of ***S. pusillum***, showing stellate hairs and Type 2 hairs (Bean 2604)

***d) Central ray*:** Five species have branchlet stellae lacking a central ray*: S. corifolium, S. dimorphispinum, S. lacunarium, S. mentiens* and *S. sturtianum.*

In most species, the central ray is about equal in length to the lateral rays or a little longer.

Several species have branchlet stellae where the central ray is very short (< 0.5 times the length of the lateral rays); *S. amblymerum, S. ammophilum, S. chrysotrichum, S. defensum, S. elachophyllum, S. elaeagnifolium, S. inaequilaterum, S. limitare, S. macoorai, S. torvum.*

At the other extreme are species where the central ray is 5–10 times the length of the laterals, giving the indumentum a shaggy or velvety appearance. These include *S. cookii, S. densevestitum, S. fervens, S. hapalum, S. innoxium, S. johnsonianum, S. lasiocarpum, S. magnifolium, S. serpens, S. stelligerum.*

The variation in the central ray ratio shows no consistent pattern within a species. In other words, the ratio on the branchlets may differ somewhat from the ratio of the lower leaf or the calyx, but it is not consistently longer or shorter on any of these plant parts. While the ratio is usually about the same within a species, a few species have widely different ratios on different plant parts *e.g. S. torvum* 0.1–0.3 *vs.* 0.8–2; *S. latens* 0.5–1 *vs.* 1.5–3; *S. lasiocarpum* 0.8–1.5 *vs.* 4–10; *S. gympiense* 1–2 *vs.* 2–4; *S. ditrichum* 0.7–1.5 *vs.* 2–3.

Type 2 hairs are very short trichomes (<0.1 mm long) occurring in Solanaceae, normally with one stalk cell, and a transparent multicellular glandular head (Seithe & Sullivan 1990). They have also been called ‘capitate-glandular trichomes’ (Whalen *et al.* 1981), ‘multicellular glands’ (Seithe 1979; Seithe & Anderson 1982) or ‘stipitate glands’ (Merrill & Perry 1949; Bean 2001). They are present, though often inconspicuous, on many species, particularly on the ovary and vegetative

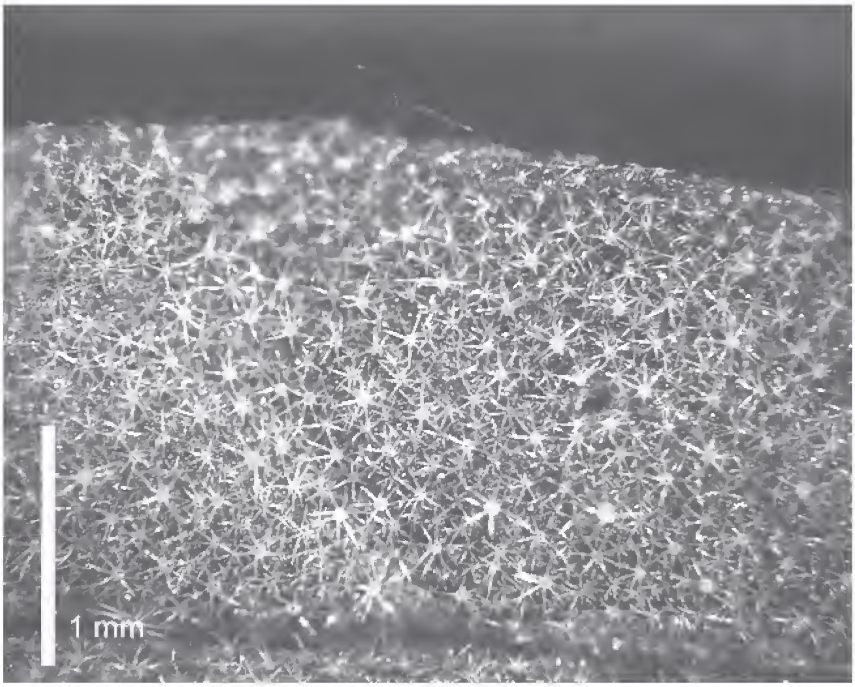

Fig. 7. Stellate hair pattern on the upper leaf surface of ***S. galbinum*** (Thomas 1817 & Thompson)

growing points (**Fig. 6**). Seithe (1979) has shown that they are not developmentally related to Type 1 hairs.

A variant of the Type 2 hair has been observed on the ovary of *S. ammophilum*. These hairs are about 0.1 mm long, have a relatively short stalk and a long ellipsoidal gland, distinctly opaque and white in colour. The glandular portion obviously secretes a great deal of mucilage, as the fruits and the inner surface of the calyx in *S. ammophilum* are quite sticky. Apart from this variant, Type 2 hairs seem quite uniform in morphology, though this may be merely a function of the difficulty in observing such a small structure.

Prickles in *Solanum* are rigid, shiny, sharply pointed structures. They are a feature of almost all species of the subgenus, and may be found on the large stems, branchlets, petioles, laminae, peduncles, pedicels, calyx, and (rarely) the corolla. Their size, shape, distribution and relative abundance is often diagnostic for a species. They are straight, acicular and spreading in the vast majority of Australian native species, but in many naturalised species, they are broad-based and often recurved. Acicular prickles are defined (for the purposes of this paper) as those that are more than 7 times longer than wide.

The fact that the prickles are derived from the lignified stalks of stellate hairs becomes obvious in a few species (*e.g. S. longissimum*), where uniseriate lateral rays are mounted near the apex of the prickles (**Fig. 4**).

Branchlet prickle density (number of prickles per decimetre (dm)) has been assessed on adult branchlets, 1–2 decimetres from the growing point.

Sometimes prickles bear indumentum *i.e.* scattered complete stellate hairs or Type 2 hairs laterally attached to the lower half of the prickle, and this can be diagnostic.

In most species, prickles can be found on the leaf lamina. Usually there are more prickles present on the upper surface, or roughly equal numbers on both surfaces. The few exceptional species (where prickles are more numerous on the lower surface) are *S. capsicoides*, *S. chrysotrichum*, *S. papaverifolium*, *S. semiarmatum* and *S. torvum*.

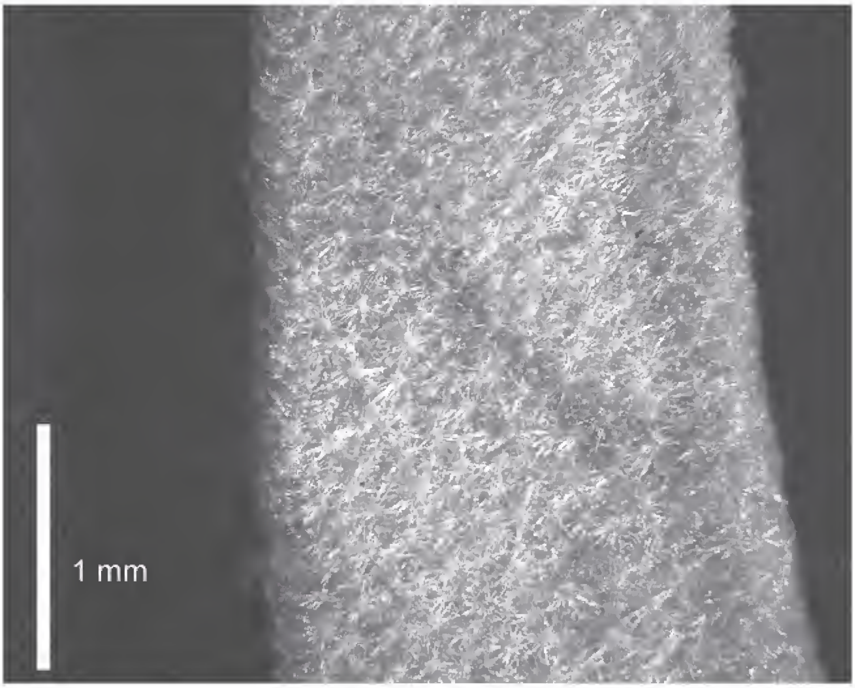

Fig. 8. Lower leaf surface of ***S. sturtianum***; stellae sessile, without a central ray, and with 13–16 lateral rays (Anderson 5070)

Materials and methods

Herbarium specimens have been borrowed from AD, BH, BM, CANB, DNA, K, MEL, NSW, PERTH, PR, and QRS.

Most measurements have been made from dried herbarium material, but material preserved in alcohol has been used for measurements on the flowers and particularly the fruits. Where preserved material was not available, flowers were rehydrated in boiling water, but dried fruits could not be reconstituted, and hence measurements of the exocarp and placenta were not attempted. Leaf dimensions have been derived from the larger leaves present on each specimen. Branchlet indumentum has been assessed from non-abraded stems 10–20 cm from the growing point of flowering or fruiting herbarium specimens.

Whenever possible, the author has examined species in the field, for the purpose of learning about the habitat, ecology, flower and fruit colour, flower sex ratio, and to collect spirit material for later study.

Comprehensive morphological descriptions of all native and currently naturalised species are provided, derived from a DELTA (DEscriptive Language for TAxonomy) (Dallwitz, Paine & Zurcher 1993) dataset of 91 taxa and 153 characters. Data were entered using the DELTA Editor (Dallwitz, Paine & Zurcher 1999), and interactive keys have been produced using Intkey (Dallwitz, Paine & Zurcher 1995; Dallwitz, Paine & Zurcher 2000).

Specimen citations have been arranged according to the Queensland Pastoral districts, and then chronologically under each district. Species doubtfully or formerly naturalised in Queensland are treated briefly at the end of this paper.

Ecology of Solanum subg. Leptostemonum

There is very little literature relating to the ecology of Australian species of *Solanum* subg. *Leptostemonum*. Floyd (1966) studied an area of eucalypt forest near Coffs Harbour in New South Wales. He recorded the species which

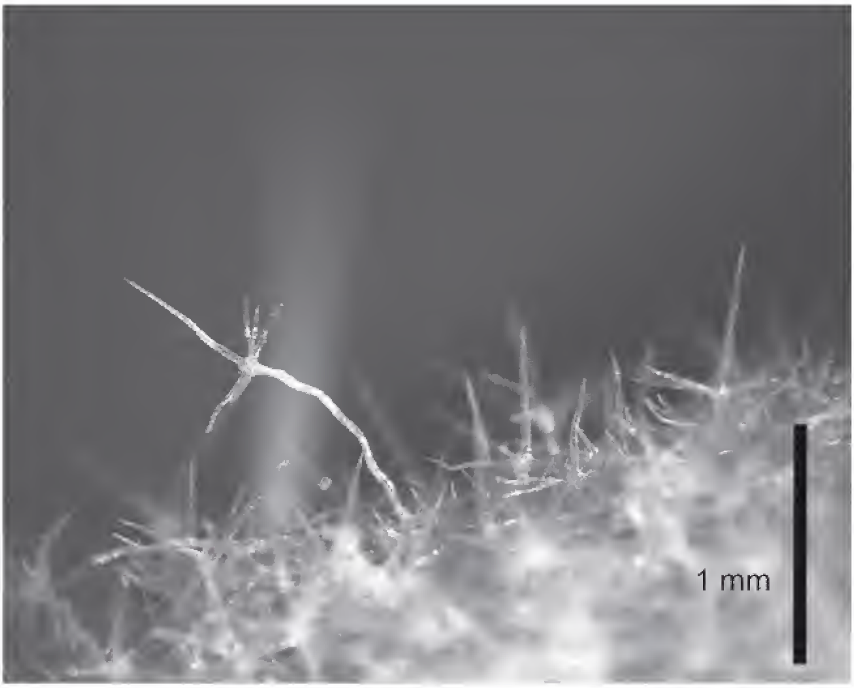

Fig. 9. Petiole of ***S. echinatum***, showing a long-stalked stellate hair (Alcock 11285)

germinated in a glasshouse from soil samples taken at an unburnt site, and compared the species with those recorded in the field (at the soil sampling site) two months after a fire. He found that four *Solanum* spp. were common at the burnt field site, but that "[seeds] were virtually absent from the soil before the fire". He attributed this difference to bird dispersal of seeds following the fire. However, the methodology does not indicate that the soil from the unburnt site was closely examined to discover what types of seeds were present, so the author may have only presumed that the soil held no *Solanum* seeds. Bird dispersal of so many seeds in such a short period, onto a bare and burnt site seems very unlikely. A more likely scenario is that the seeds were *already* in the soil (gradually dispersed over the years), and that fire broke the dormancy of the seeds.

In the absence of other published data, I offer the following observations and comments on the Queensland members in the hope that they will stimulate formal study. These observations stem from a desire to understand why many species are so reclusive and transitory.

1. Life Form

Various life-forms have been observed for Queensland species:

(a) herbaceous resprouters - where the above-ground portion dies each year, but the root or rhizome is persistent *e.g.* *S. adenophorum, S. angustum, S. limitare, S. multiglochidiatum, S. papaverifolium, S. stenopterum, S. versicolor*. These species are leafy for only 3–6 months a year. This term is synonymous with the often-used 'herbaceous perennial'. It would seem that no Queensland species is truly annual in habit.

(b) perennials - where the above-ground part of the plant lives for several years, normally not perishing after the first flowering and fruiting. Perennials can be subdivided into two sub-types:

(i) stoloniferous perennials (only three species; *S. acanthodapis*, *S. serpens* and *S. mentiens*), ground-hugging trailing shrubs that root frequently at the nodes.

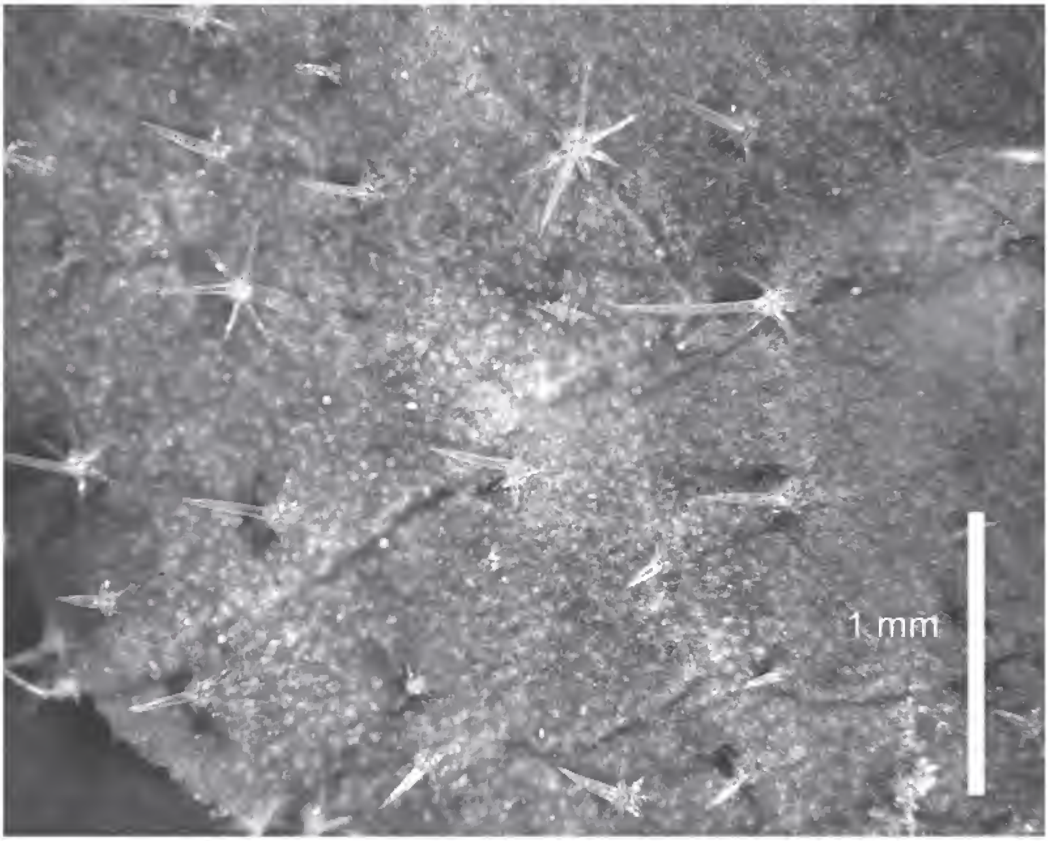

Fig. 10. Upper leaf surface of ***S. linnaeanum***, showing stellae at various developmental stages (Forster 28894)

(ii) rhizomatous perennials (very common type), which form clusters of seemingly separate individuals. These colonies are clonal, being connected by an extensive system of horizontal roots just below the soil surface, and may extend in size from one to hundreds of square metres. Species in this category include *S. corifolium, S. densevestitum, S. ellipticum, S. ferocissimum, S. stelligerum,* and *S. stupefactum*. In some larger and longer-lived species occurring in mesic environments *e.g. S. francisii, S. inaequilaterum, S. nobile, S. semiarmatum,* and *S. viridifolium,* regeneration may be largely from seed.

2. *Major habitats*

(a) evergreen notophyll rainforest (with no eucalypt forest nearby). These species exploit canopy gaps, where there is enough light to allow flower and fruit development. Fire is absent.

S. acanthodapis, S. cookii, S. corifolium, S. dimorphispinum, S. dryanderense, S. eminens, S. francisii, S. hamulosum, S. inaequilaterum, S. lasiocarpum, S. macoorai, S. mentiens, S. nobile, S. rixosum, S. semiarmatum, S. serpens, S. sporadotrichum, S. vicinum, S. viridifolium.

(b) margins of evergreen notophyll rainforest, or eucalypt forest with rainforest understorey (often described as "wet sclerophyll") on basaltic or other fine-grained soils. Fire occurs infrequently.

S. cookii, S. densevestitum, S. dimorphispinum, S. ditrichum, S. eminens, S. hapalum, S. intonsum, S. latens, S. limitare, S. macoorai, S. magnifolium, S. nobile, S. parvifolium subsp. tropicum, *S. rixosum, S. semiarmatum, S. shirleyanum, S. sporadotrichum, S. stelligerum, S. stupefactum, S. tetrathecum, S. vicinum, S. viridifolium.*

(c) semi-evergreen vine thicket or brigalow (*Acacia harpophylla*) or Belah (*Casuarina cristata*) dominated communities on cracking clays. Fire is normally absent.

S. adenophorum, S. coracinum, S. dissectum, S. dumicola, S. elachophyllum, S. ellipticum, S. esuriale, S. furfuraceum, S. johnsonianum, S. latens, S. mitchellianum, S. multiglochidiatum, S. parvifolium subsp. *parvifolium, S. sporadotrichum, S. stenopterum, S. tetrathecum.*

(d) semi-deciduous vine forest on quaternary sand deposits, laterite or granite hills (Cape York Peninsula). Fire is normally absent.

S. defensum, S. discolor, S. dunalianum, S. dysprosium, S. fervens, S. yirrkalense.

(e) shrubby eucalypt woodland, remote from rainforest or vine thicket. Fire occurs frequently.

S. amblymerum, S. angustum, S. carduiforme, S. chippendalei, S. cinereum, S. coracinum, S. crassitomentosum, S. crebrispinum, S. echinatum, S. ellipticum, S. ferocissimum, S. furfuraceum, S. galbinum, S. graniticum, S. gympiense, S. intonsum, S. jucundum, S. limitare, S. longissimum, S. mitchellianum, S. multiglochidiatum, S. nemophilum, S. parvifolium subsp. *parvifolium, S. quadriloculatum, S. senticosum, S. stelligerum, S. tetrathecum, S. ultimum.*

(f) lancewood communities (dominated by *Acacia catenulata, A. shirleyi, A. burrowii, A. sparsiflora* or *A. blakei*) on lateritised Cainozoic duricrusts associated with low mesas or scarps. Soil may be red earth, brown loam, or skeletal on plateau margins. Fire occurs infrequently.

S. argopetalum, S. cocosoides, S. ellipticum, S. galbinum, S. innoxium, S. jucundum, S. latens, S. lythrocarpum, S. pusillum, S. ultimum.

(g) red earths in mulga (*Acacia aneura*) dominated communities.

S. centrale, S. ellipticum, S. ferocissimum, S. quadriloculatum, S. sturtianum, S. versicolor.

(h) grassland or open woodland on heavy cracking clays.

S. esuriale, S. lacunarium, S. papaverifolium, S. stenopterum.

(i) shrublands in arid zone.

S. ammophilum, S. chenopodinum, S. oligacanthum, S. sturtianum.

(j) saline littoral zone.

S. pugiunculiferum.

(k) degraded land (where frequent and/or gross disturbance has allowed exotic species to partially or completely replace the native flora).

S. capsicoides, S. chrysotrichum, S. elaeagnifolium, S. incanum, S. linnaeanum, S. rostratum, S. sisymbriifolium, S. torvum.

Species from the arid and semi-arid zones frequently occur underneath trees, which may reflect the preferential deposition of seeds by birds, or some requirement for protection from the sun during the middle of the day, or relief from grass competition.

No species occurs in heathlands, mangroves or swamps.

3. Likelihood

The likelihood of encountering species of *Solanum* subg. *Leptostemonum* increases as you move from:

- low-nutrient soil to high-nutrient soil
- woodland to closed forest/rainforest
- low altitude to high altitude
- poorly drained sites to well drained sites
- frosty areas to frost-free areas

In other words, there are few (or no) species in woodland with sandy soil at low altitude, and (potentially) numerous species on basaltic soil in rainforest at high altitude.

4. Response to disturbance

Most (perhaps all?) species can be classified as pioneer species. They are promoted by disturbance events, which may be grouped into three main types:

a) *Fire*: No species has a lignotuber, hence above ground parts are killed by moderate intensity fires, but on the other hand, most species are rhizomatous. Fire encourages seed germination, promotes regeneration from rhizomes and removes competition for light and nutrients. Absence of fire for a long period may see the decline or local extinction of *Solanum* spp.

b) *Cyclone*: For those species that grow in dense rainforest environments, they must rely on severe storms and cyclones (in the absence of land-clearing activities) to open the tree canopy and allow sufficient light for them to grow and reproduce, and thereby maintain the soil seedbank.

c) *Mechanical*: Mechanical disturbance of the soil can have the same effect as fire *i.e.* promoting the seed germination and/or regeneration from rhizomes. This type of disturbance is usually man-induced *e.g.* roadworks, quarries, logging etc.

In suitable recently disturbed sites, solanums may occur in large numbers. The numbers then gradually dwindle until, after a few years, none is left. Hence, *Solanum* spp. (perennials as well as herbaceous resprouters) often cannot be relocated at (uncleared) sites where they were recorded only a few years before.

Native *Solanum* species do not fare very well in company with other shrubs, forbs or graminoids. They are easily out-competed by a dense sward of grass or by clumps of shrubs. They are not favoured by frequent disturbance *e.g.* soil tilling, as there is insufficient time for seed production or re-establishment of rhizome networks.

In summary, indigenous species in *Solanum* subg. *Leptostemonum* are favoured by infrequent major disturbance (cyclonic, mechanical or fire), provided that such disturbance does not stimulate the proliferation of exotic weeds.

Conservation Status

In general, native *Solanum* species appear to be in decline. Some species from rainforest-margins eg. *S. ditrichum*, *S. rixosum*, can no longer be found in many districts where they were recorded in the early 1900's. Rainforest margins are the preferred habitat of the pernicious weed *Lantana camara*. It seems clear that this exotic shrub has caused serious decline in the populations of many *Solanum* species treated in this paper.

The Brigalow communities of central Queensland have been so reduced by land clearance, that some species, *e.g. S. dissectum*, *S. adenophorum*, and *S. johnsonianum,* are now endangered or critically endangered. Remaining populations are threatened by aggressive weeds such as *Panicum maximum, Parthenium hysterophorus,* and deliberately introduced pasture grasses, especially *Cenchrus ciliaris*.

All species have been assessed against the IUCN Red List categories and criteria (IUCN. 2001). With regard to 'mature individuals', I have followed the IUCN recommendation that "reproducing units within a clone should be counted as individuals, except where such units are unable to survive alone (*e.g.* corals)", and that where population size fluctuates, "use a lower estimate".

Both of these recommendations have implications for the *Solanum* assessments. In *Solanum* subg. *Leptostemonum*, clones are the rule rather than the exception, and fluctuations in population size occur in most (if not all) species. However, I have not interpreted these fluctuations as "extreme", as this would have invoked Criteria B1c(iv) and/or B2c(iv) and C2b. This would result in many 'stable' taxa (having no apparent threat) being recognised as threatened. Species assessments have been done on an Australia-wide basis. Overseas occurrences have not been considered.

For some species, a herbarium collection during the last 10–15 years has been accepted as a current location, even though experience has shown that solanums can only rarely be found at old collection sites. Sometimes the species may still be present (as seed or rhizomes) and sometimes it has disappeared altogether.

Of the 82 indigenous taxa treated in this paper, 2 have been assessed as "Critically Endangered", 8 as "Endangered" and 14 as "Vulnerable".

Solanum as food

Solanum fruits were an important source of food for Australian Aborigines, particularly in the arid areas. Their importance in the arid zone was due to a number of factors - they are readily available and collectable and visibly obvious; they can be stored for later use, and most species can be eaten without preparation (Peterson 1979).

Several species were used consistently by aborigines in arid Australia. *Solanum centrale* may be eaten when ripe or ground into a paste and moulded into balls which keep indefinitely. *S. chippendalei* is edible, but only after removal of the bitter seeds and placenta. They may then be eaten fresh, or dried-out and stored on skewers. Dried fruits can be reconstituted in water before consumption. *S. ellipticum* is reported to be an important species which can be eaten fresh. *S. esuriale* can also be eaten fresh, or stored as above (Peterson 1979, Latz 1995).

Other arid zone species are strongly poisonous, *e.g. S. quadriloculatum* (Everist 1974, Latz 1995), and were avoided by all aboriginal groups. Other species given by Everist (*loc. cit.*) as definitely poisonous, at least to livestock, are *S. elaeagnifolium*, *S. linnaeanum* and *S. sturtianum*. Several other species were suspected to be poisonous.

Solanum appears to have been of much less importance as a food in coastal areas, because of their lesser frequency and the many other food sources available in these areas. However, *S. stelligerum* fruits were reported by Lampert & Saunders (1973) to be edible. *S. hapalum* fruits likewise are edible (R. Fensham pers. comm.).

Cytology

Randell & Symon (1976) undertook extensive chromosome counts of Australian *Solanum* spp. They found that n = 12 or 24 for all members of S. subg. *Leptostemonum*. No other numbers have been reported.

Hybrids

Naturally occurring hybrids appear to be rare in *Solanum* subg. *Leptostemonum*, at least in Australia. Symon (1981) made no mention of hybridisation. I have personally seen only one instance of a presumed interspecific hybrid in the field. In an area where *Solanum latens* and *S. nemophilum* were both common, there was a small colony of plants displaying traits intermediate between these two species, *viz.* leaf size, indumentum density, stem prickliness, and stellate hair size (voucher material at BRI; AQ 772057).

Classification

With about 500 species world-wide, *Solanum* subg. *Leptostemonum* has a diverse membership, and classifying them has and will present difficulties. The conspectus by Whalen (1984) has provided an excellent framework for the whole subgenus, and a basis for future work. He presented 33 informal taxonomic groups for the subgenus, arranged in systematic order. By his own admission, his knowledge of the Old World taxa was limited, and so it is perhaps not surprising that I have made many amendments to his classification for taxa occurring in Queensland. This has entailed the shifting of many species to a more appropriate group, and the creation of new groups where Whalen broadly circumscribed them (especially the *S. ellipticum* group). The native Australian species are here classified into 15 informal groups, compared to the 8 groups recognised by Whalen (*loc. cit.*), but the average Australian group size is only now comparable to the average group size for New World taxa in Whalen (*loc. cit.*).

I have retained Whalen's group numbers except for Group 6 (*S. macoorai* group), where the "type" species was obviously misplaced. New groups have been slotted in with the addition of letters *e.g.* 13A. These are not intended to represent "subgroups", but rather are equal in rank to Whalen's established groups.

Informal taxonomic groups for Australian *Solanum* subg. *Leptostemonum*, adapted from Whalen (1984).

Notes: All accepted Australian species are listed. Queensland and north-eastern N.S.W. taxa are listed in roman script; non-Queensland taxa are given in italics. Naturalised species are denoted by an asterisk.

Group 5	S. dunalianum group; S. dunalianum, *S. tetrandrum,* S. viridifolium.
Group 9A	S. densevestitum group; S. densevestitum, S. gympiense, S. hapalum, S. innoxium, S. johnsonianum, S. nemophilum, S. ultimum.
Group 13	S. ferocissimum group; S. chenopodinum, S. corifolium, S. defensum, S. discolor, S. dissectum, S. dryanderense, S. dysprosium, S. ferocissimum, S. fervens, S. inaequilaterum, S. latens, S. lythrocarpum, S. mentiens, S. parvifolium, S. shirleyanum, S. stelligerum, S. yirrkalense.
Group 13A	S. semiarmatum group; S. coracinum, S. mitchellianum, S. semiarmatum.
Group 14	S. torvum group; S. chrysotrichum*, S. torvum*.
Group 22	S. quitoense group; S. lasiocarpum.
Group 23	S. mammosum group; S. capsicoides*.
Group 25	S. hystrix group; S. adenophorum, *S. campanulatum,* S. cookii, S. ditrichum, *S. eardleyae, S. eremophilum,* S. graniticum, *S. hoplopetalum, S. hystrix,* S. lacunarium, S. multiglochidiatum, *S. oligandrum,* S. papaverifolium, *S. petrophilum, S. prinophyllum, S. pungetium,* S. pusillum, S. stenopterum, S. vicinum.
Group 25A	S. pugiunculiferum group; S. pugiunculiferum
Group 27	S. ellipticum group; S. angustum, S. argopetalum, S. crebrispinum, S. crassitomentosum, S. dianthophorum, S. ellipticum, *S. horridum,* S. quadriloculatum, S. senticosum, *S. terraneum.*
Group 27A	S. hamulosum group; S. dimorphispinum, S. eminens, S. hamulosum.
Group 27B	S. macoorai group; S. acanthodapis, S. amblymerum, *S. armourense, S. brownii, S. celatum,* S. centrale, S. cinereum, S. cocosoides, *S. curvicuspe,* S. dumicola, S. francisii, S. furfuraceum, S. galbinum, S. intonsum, S. jucundum, S. limitare, S. macoorai, S. magnifolium, *S. neoanglicum,* S. nobile, S. rixosum, S. serpens, *S. silvestre,* S. sporadotrichum, S. tetrathecum.
Group 27C	S. esuriale group; ammophilum, *S. coactiliferum,* S. elachophyllum, S. elaeagnifolium*, S. esuriale, *S. hesperium, S. karsense, S. nummularium, S. oldfieldii,* S. oligacanthum, *S. orbiculatum, S. plicatile,* S. sturtianum, S. versicolor.
Group 27D	S. lasiophyllum group; *S. ashbyae, S. gabrielae, S. gilesii, S. lachnophyllum, S. lasiophyllum.*
Group 27E	S. echinatum group; S. echinatum, S. longissimum, *S. lucani.*
Group 28	S. dioicum group; *S. asymmetriphyllum, S. beaugleholei,* S. carduiforme, *S. cataphractum,* S. chippendalei, *S. clarkiae, S. cunninghamii, S. dioicum, S. diversiflorum, S. eburneum, S. heteropodium, S. leopoldense, S. melanospermum, S. oedipus, S. petraeum, S. phlomoides, S. tudununggae, S. vansittartense.*
Group 29	S. incanum group; S. incanum*, S. linnaeanum*, _S. marginatum_*, S. stupefactum.
Group 33	S. rostratum group; S. rostratum*.
Ungrouped	S. sisymbriifolium*

Biogeography

With 82 indigenous species, 50 of these endemic, Queensland and north-eastern New South Wales is the centre of diversity for *Solanum* subg. *Leptostemonum* in Australia, and has perhaps a higher concentration of species than anywhere else in the Old World.

Fig. 11 shows the number of native species occurring in each 1 × 1 degree square. The highest diversity of 16 spp. is recorded for a square straddling the Queensland-New South Wales border, extending from Warwick in the west to Kyogle in the east, and from Cunningham's Gap almost to Tenterfield. This square contains large areas of rainforest, and

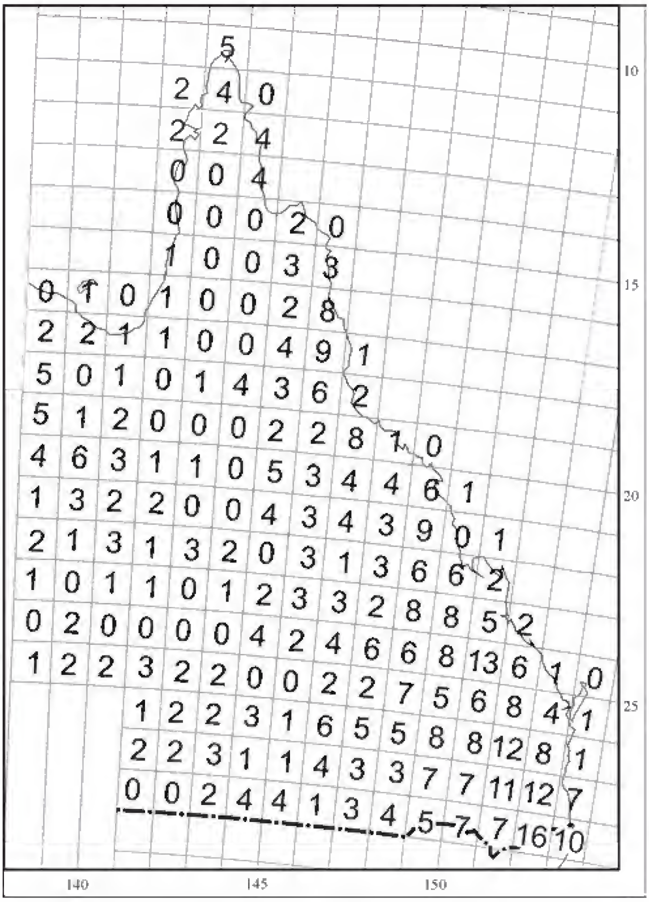
5
2 4 0
2 2 4
0 0 4
0 0 0 2 0
1 0 0 3 3
0 1 0 1 0 0 2 8
2 2 1 1 0 0 4 9 1
5 0 1 0 1 4 3 6 2
5 1 2 0 0 0 2 2 8 1 0
4 6 3 1 1 0 5 3 4 4 6 1
1 3 2 2 0 0 4 3 4 3 9 0 1
2 1 3 1 3 2 0 3 1 3 6 6 2
1 0 1 1 0 1 2 3 3 2 8 8 5 2
0 2 0 0 0 0 4 2 4 6 6 8 13 6 1 0
1 2 2 3 2 2 0 0 2 2 7 5 6 8 4 1
1 2 2 3 1 6 5 5 8 8 12 8 1
2 2 3 1 1 4 3 3 7 7 11 12 7
0 0 2 4 4 1 3 4 5 7 7 16 10
10
15
20
25
140
145
150

Fig. 11. Number of indigenous species of *Solanum* subg. *Leptostemonum* recorded for each 1° × 1° square in Queensland and far north-eastern New South Wales north of 29° S latitude, based on herbarium records.

includes the highest mountain in southern Queensland (Mt Superbus, 1381 metres). The adjoining square to the east boasts 10 native species, even though half of the square is ocean. This square includes Lamington N.P., Mt Warning, Byron Bay and Lismore. Along a 5 km stretch of road near the Lamington N.P., I have recorded 8 native species (*S. corifolium, S. ditrichum, S. inaequilaterum, S. limitare, S. rixosum, S. semiarmatum, S. serpens, S. stelligerum*), which must surely be the richest area for *Solanum* subg. *Leptostemonum* in Australia.

The next most diverse square (13 spp.) surrounds the town of Biloela. It includes the Kroombit Tops area, Coominglah S.F., the Callide Range and, to the west and north of Biloela, some small remnants of Brigalow forest. All are important havens for *Solanum.*

The three next most diverse squares (with 12, 12, and 11 spp.) are all in the far southeast of Queensland, and all contain areas of high altitude rainforest, of which the most notable is the Bunya Mountains. There are 6 spp. at the Bunya Mountains.

Away from the southeast quarter of the state, the highest diversity (9 spp.) is found in the square that includes Nebo, Mirani, Dipperu N.P. and Eungella. The Eungella N.P. is an area of high altitude rainforest containing an endemic species (*S. francisii*), while Dipperu N.P. and adjacent uncleared areas are dominated by Brigalow forest. The critically endangered *S. adenophorum* has been recorded from Dipperu N.P.

Further north, the square that includes the Atherton Tableland has 9 spp., and the

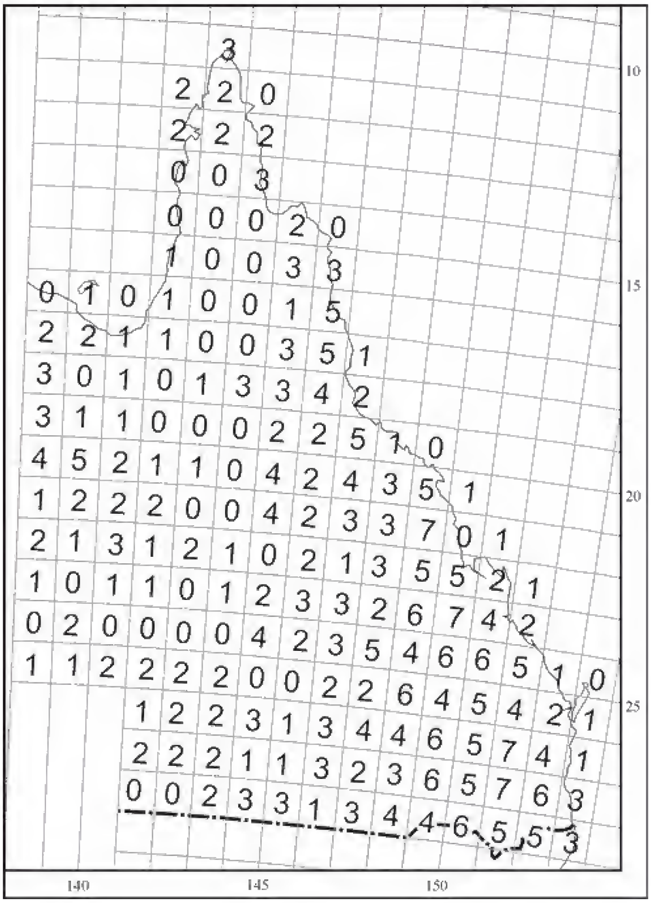
3
2 2 0
2 2 2
0 0 3
0 0 0 2 0
1 0 0 3 3
0 1 0 1 0 0 1 5
2 2 1 1 0 0 3 5 1
3 0 1 0 1 3 3 4 2
3 1 1 0 0 0 2 2 5 1 0
4 5 2 1 1 0 4 2 4 3 5 1
1 2 2 2 0 0 4 2 3 3 7 0 1
2 1 3 1 2 1 0 2 1 3 5 5 2 1
1 0 1 1 0 1 2 3 3 2 6 7 4 2
0 2 0 0 0 0 4 2 3 5 4 6 6 5 1 0
1 1 2 2 2 2 0 0 2 2 6 4 5 4 2 1
1 2 2 3 1 3 4 4 6 5 7 4 1
2 2 2 1 1 3 2 3 6 5 7 6 3
0 0 2 3 3 1 3 4 4 6 5 5 3
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Fig. 12. Number of informal groups of *Solanum* subg. *Leptostemonum* present in each 1° × 1° square in Queensland and far north-eastern New South Wales north of 29° S latitude, based on herbarium records (includes only those groups that contain indigenous species).

square immediately to its north has 8 spp. Both of these squares have large areas of rainforest, much of it at high altitudes.

In general, as one moves further from the coast, the species diversity decreases, strongly correlated with the decreasing rainfall, but even in the far southwest of Queensland, some species occur, *e.g. S. oligacanthum, S. sturtianum*. In the arid parts of the state, the highest diversity (6 spp.) is achieved in the square surrounding Mt Isa.

Two of Queensland's biogeographic regions (Thackway & Cresswell 1995) have a very depauperate *Solanum* flora. The "Gulf Plains", a bioregion characterised by extensive marine plains, alluvial clay plains and areas of sandy outwash, apparently has no species at all, except for *S. pugiunculiferum* near the coast. The "Cape York Peninsula" biogeographic region has solanums only in rainforest areas; the extensive *Eucalyptus* and *Melaleuca* woodlands are apparently *Solanum*-free zones.

Fig. 12 shows the distribution of informal groups (see Classification section, above) across Queensland and northeastern New South Wales. The highest diversity per square is 7 groups, known from four squares (Duaringa area, Eungella–Nebo area, Kingaroy–Bunya Mtns area, Dalby–Toowoomba–Milmerran area). This level of group diversity exceeds all other parts of the Old World, based on Whalen (1984), but is still less diverse than some areas in South America.

Table 1. The most widespread taxa in Queensland, based on the number of 1°× 1° squares in which they are found.

Species	Number of 1° × 1° squares
S. ellipticum	72
S. esuriale	55
S. ferocissimum	25
S. parvifolium subsp. *parvifolium*	24
S. stelligerum	17
S. mitchellianum	17
S. jucundum	17
S. viridifolium	15
S. nemophilum	13
S. galbinum	13
S. furfuraceum	12
S. corifolium	12
S. chippendalei	10
S. quadriloculatum	10

Taxonomy

Key to informal taxonomic groups of *Solanum* subg. *Leptostemonum* (as listed above)

1. Mature fruits with juicy mesocarp, exocarp thin, bright red or black; fruits relatively small (mostly <12 mm diameter) 2
   Mature fruits with mesocarp dry to moist but not juicy, exocarp thick, often green to yellow, occasionally orange or purple, rarely red; fruits larger (mostly >12 mm diameter) 5

2. Some or all inflorescences branched 3
   All inflorescences unbranched **or** pseudo-umbellate 4

3. Mature fruits black; branchlets very prickly; leaves with stellate hairs; flowers 5-merous . . . . **13A. S. semiarmatum group**
   Mature fruits red; branchlets without prickles; fully expanded leaves glabrous; flowers 4 or 5-merous . . . . **5. S. dunalianum group**

4. Plants completely without prickles; calyx lobes elliptic, exceeding mature fruits; inflorescences pseudo-umbellate, without common peduncle . . . . **9A. S. densevestitum group**
   Plants at least sparsely prickly, calyx lobes various, but not elliptic and not exceeding mature fruits; common peduncle present . . . . **13. S. ferocissimum group**

5. Inflorescences with dimorphic flowers (1 or more very prickly bisexual flowers at base with several less-prickly smaller male flowers beyond, or plants dioecious) 6
   Inflorescences with flowers all of similar size and prickliness, although functionally male flowers may be frequent 7

6. Inflorescence with few distal male flowers; fruiting calyx not markedly accrescent, not enclosing fruit; style with indumentum .... **29. S. incanum group**
   Inflorescence with numerous male flowers on long rachis; fruiting calyx accrescent, tube often enclosing fruit; style glabrous .... **28. S. dioicum group**

7. Calyx prickles absent, or with 1–5 per flower 8
   Calyx moderately to densely prickly (10–200 per flower)......................... 12

8. Stellate hairs absent from stems, leaves and calyx; corolla radius 4–5 mm; anthers 1.5–2 mm long .... **25A. S. pugiunculiferum group**
   Stellate hairs present; corolla radius 7–20 mm; anthers 3–9 mm long............... 9

9. Prickles on branchlets 1–4 times longer than broad, recurved 10
   Prickles on branchlets 5–20 times longer than broad, straight 11

10. Inflorescence branched; plants shrubby .... **14. S. torvum group**
    Inflorescence unbranched; plants vine-like, scrambling ...... **27A. S. hamulosum group**

11. Stellae with 8 or fewer lateral rays; leaves mostly green on the upper surface .... **27B. S. macoorai group**
    Many stellae with more than 8 rays; leaves usually with dense indumentum on both sides .... **27C. S. esuriale group**

12. Leaves with finger hairs only .... **23. S. mammosum group**
    Leaves with stellate hairs, finger hairs sometimes also present 13

13. Fruits completely enclosed by accrescent calyx 14
    Fruits readily visible, calyx not accrescent 15

14. All anthers similar; leaves entire or with shallow lobes .... **27E. S. echinatum group**
    One anther much longer than the other four; leaves deeply lobed .... **33. S. rostratum group**

15. Leaves ± entire, upper surface moderately to very densely hairy; perennial shrubs; finger hairs rarely present; petioles not winged .... **27. S. ellipticum group**
    Leaves shallowly to deeply lobed, upper surface glabrous or sparsely hairy; herbaceous resprouters; finger hairs frequently present; petioles frequently winged .... **25. S. hystrix group**

Dichotomous key to the Queensland species of *Solanum* subg. *Leptostemonum*

Notes: i.) This key is designed for the identification of dried herbarium specimens. Although macroscopic characters have been used wherever possible, microscopic examination of the stellate hairs will be necessary in some instances. Neither open flowers nor mature fruits are required to successfully operate this key, but frequently some fertile material with intact calyces will be needed.

ii) 'leaves' are adult leaves unless otherwise stated; similarly 'branchlets' are adult branchlets

iii.) leaf lobing index = length of lobe halfway along lamina divided by parallel length of adjacent sinus (**Fig. 1**). Used to quantify degree of lobing; entire leaves have an index of 1, deeply lobed leaves have an index >2.

iv.) the fruit diameters and colours given apply to fresh mature fruits

v.) finger hairs - uniseriate unbranched (simple) hairs consisting of more than one cell, and usually 0.5–5 mm long.

vi.) Type 2 hairs - very short trichomes (<0.1

mm long), normally with one stalk cell, and a transparent multicellular glandular head.

vii.) stellate hair density

very dense - stellae overlapping, multi-layers, subtending surface not visible with hand lens

dense - stellae overlapping, 0.1–0.5 diameters apart, subtending surface visible

moderate - stellae overlapping, 0.5–1 diameter apart, centre to centre

sparse - stellae not overlapping, 1–2 diameters apart, centre to centre

very sparse - stellae not overlapping, > 2 diameters apart, centre to centre.

1. Leaf margins with 2 or more pairs of deep lobes (lobing index >2) OR leaf base hastate . 2
Leaf margins entire or shallowly lobed throughout (lobing index 1–2) 23

2. Some or all leaves with hastate base 3
Leaves deeply lobed throughout, never hastate 6

3. Stellae of lower leaf surface with central ray 1.5–3 times as long as laterals . . **21. S. latens**
Stellae of lower leaf surface with central ray 0–1 times as long as laterals 4

4. Corolla rotate, mature fruits green, 11–16 mm diameter; pedicels 0.8–0.9 mm thick at anthesis . . . . **73. S. amblymerum**
Corolla deeply lobed, mature fruits red, 6–9 mm diameter; pedicels 0.2–0.7 mm thick at anthesis 5

5. Lamina 1.1–2.6 cm wide at midpoint; branchlet prickles broad-based (4–7 times longer than wide); fruiting pedicels 8–12 mm long . . . . **24. S. chenopodinum**
Lamina 0.2–0.7 cm wide at midpoint; branchlet prickles acicular (9–13 times longer than wide); fruiting pedicels 13–16 mm long . . . . **20. S. ferocissimum**

6. Stellate hairs completely lacking from branchlets and leaves 7
At least some stellate hairs present on branchlets or leaves 11

7. Finger hairs present on leaves 8
Finger hairs absent from leaves (Type 2 hairs sometimes present) 9

8. Finger hairs gland-tipped . . . . **39. S. adenophorum**
Finger hairs not gland-tipped . . . . **33. *S. capsicoides**

9. Calyx with 12–40 prickles; petioles 2.1–3.4 cm long . . . . **38. S. papaverifolium**
Calyx unarmed or with 1–4 prickles; petioles 0.3–1.2 cm long 10

10. Calyx with 1–4 prickles; leaf prickles broad-based; fruiting pedicel 5–8 mm long; Bk & Co . . . . **44. S. pugiunculiferum**
Calyx without prickles; leaf prickles acicular; fruiting pedicels 10–19 mm long; Pc & Le . . . . **22. S. dissectum**

11. Upper leaf surface stellae dense to very dense 12
Upper leaf surface stellae absent or very sparse to moderate 13

12. Branchlet stellae 0.25–0.5 mm diameter; prickles 6–70 on lower leaf surface; fruiting calyx tube accrescent, enclosing fruit; dioecious species . . . . **85. S. carduiforme**
Branchlet stellae 0.8–1.3 mm diameter; prickles 0–5 on lower leaf surface; fruiting calyx tube not accrescent, lobes shorter than mature fruit . . **84. S. chippendalei**

13. Fruits completely enclosed by prickly calyx; corolla yellow; style sigmoid
 . . . . **89. *S. rostratum**
 Fruiting calyx tube not accrescent; corolla white to purple; style erect 14

14. Branchlets with 350–1400 prickles per dm; mature fruits black 15
 Branchlets sparsely to moderately prickly (2–60 prickles per dm); mature
 fruits green, yellow or red 16

15. Lower leaf surface green; calyx without prickles . . . . **27. S. coracinum**
 Lower leaf surface white to yellowish; calyx with up to 25 short prickles
 . . . . **29. S. semiarmatum**

16. Lower leaf surface very densely stellate-hairy 17
 Lower leaf surface sparsely to moderately stellate-hairy 19

17. Calyx prickles absent or 1–5; lower leaf surface with 0–2 prickles . . . . **71. S. nobile**
 Calyx prickles 15–65; lower leaf surface with 6–45 prickles 18

18. Branchlet stellae sparse, central ray absent; branchlet prickles 5–9 times
 longer than wide; mature fruits 12–15 mm diameter . . . . **43. S. lacunarium**
 Branchlet stellae dense to very dense, central ray present; branchlet prickles
 11–16 times longer than wide; mature fruits 17–28 mm diameter . . . . . **70. S. cinereum**

19. Finger hairs present on lower leaf surface . . . . **90. *S. sisymbriifolium**
 No finger hairs on lower leaf surface 20

20. Branchlet prickles broad-based, 2–4 times longer than wide . . . . **88. *S. linnaeanum**
 Branchlet prickles acicular, 10–16 times longer than wide 21

21. Lamina 1.2–2.6 cm long; petiole 0.15–0.45 cm long . . . . **41. S. graniticum**
 Lamina 3–7 cm long; petiole 0.5–1.8 cm long 22

22. Upper and lower leaf surfaces and calyx with Type 2 hairs; corolla white;
 pedicels 3–6 mm long at anthesis . . . . **40. S. pusillum**
 Type 2 hairs absent; corolla purple; pedicels 21–38 mm long at anthesis
 . . . . **42. S. stenopterum**

23. Calyx prickles present on some or all flowers/fruits of inflorescence 24
 Calyx prickles absent from all flowers/fruits 50

24. Finger hairs present on branchlets 25
 Finger hairs absent from branchlets 27

25. Stellate hairs absent from branchlets and leaves . . . . **33. *S. capsicoides**
 Stellate hairs present on branchlets and lower leaf surface 26

26. Stellate hairs frequent on upper leaf surface, Type 2 hairs absent; calyx
 stellae central ray 1–1.5 times as long as laterals; mature fruits 21–26 mm
 diameter . . . . **34. S. ditrichum**
 Stellate hairs absent from upper leaf surface, Type 2 hairs present; calyx
 stellae absent or central ray 4–6 times as long as laterals; mature fruits
 11–13 mm diameter . . . . **35. S. cookii**

27. Branchlet prickles curved, 2–3 times longer than broad . . . . **87. *S. incanum**
 Branchlet prickles straight, 5–20 times longer than broad 28

28. Fruiting calyx tube accrescent, covering fruit 29
    Fruiting calyx tube not accrescent, and lobes not exceeding mature fruit 30

29. Branchlet prickles 200–660 per dm; petioles 25–55% of lamina length; calyx lobes 3–6 mm long at anthesis; fruiting pedicels 10–18 mm long **82. S. echinatum**
    Branchlet prickles 3–80 per dm; petioles 65–115% of lamina length; calyx lobes 1–2.5 mm long at anthesis; fruiting pedicels 20–30 mm long . **83. S. longissimum**

30. Branchlet stellae with central ray 2–4 times as long as laterals; Type 2 hairs present on branchlets and upper leaf surface; fruits densely hairy .... **86. S. stupefactum**
    Branchlet stellae with central ray 0–1.8 times as long as laterals; Type 2 hairs absent; fruits glabrous or with a few scattered hairs 31

31. Stellae of upper leaf surface very sparse to moderate (rarely absent) 32
    Stellae of upper leaf surface dense to very dense 43

32. Leaves 2.8–10 cm wide 33
    Leaves 0.4–2.7 cm wide 39

33. Calyx prickles 0–11 34
    Calyx prickles 12–100 37

34. Leaves 6.5–10 cm wide; Type 2 hairs present on calyx................. **64. S. francisii**
    Leaves 2.8–5.2 cm wide; Type 2 hairs absent from calyx 35

35. Plants erect; leaf lobing index 1.7–2 .... **71. S. nobile**
    Plants prostrate or procumbent; leaf lobing index 1–1.4......................... 36

36. Upper leaf surface green, stellae very sparse or confined to midrib; calyx prickles 0–2 .... **60. S. acanthodapis**
    Upper leaf surface grey-green, stellae density moderate; calyx prickles 5–11 .... **45. S. ellipticum**

37. Upper leaf surface with 2–20 prickles, stellae 0.1–0.5 mm apart; lower leaf surface white or yellowish, stellae 0.05–0.3 mm apart .... **45. S. ellipticum**
    Upper leaf surface with 100–400 prickles, stellae 0.6–2.5 mm apart; lower leaf surface green, stellae 0.3–2.2 mm apart 38

38. Leaves entire or obscurely lobed, apex obtuse; common peduncle 17–27 mm long; mature fruits yellowish-green or green; Nk & Co ..... **36. S. multiglochidiatum**
    Leaves with distinct acute lobes, apex acute; common peduncle 0–8 mm long; mature fruits purple; Wb, Mo & Dd .... **37. S. vicinum**

39. Branchlet stellae sparse; pedicels 21–38 mm long at anthesis; petioles winged; stellae of lower leaf surface 0.8–3 mm apart .... **42. S. stenopterum**
    Branchlet stellae dense to very dense; pedicels 3–20 mm long at anthesis; petioles not winged; stellae of lower leaf surface 0.05–0.7 mm apart 40

40. Leaves 1.6–2.9 times longer than broad 41
    Leaves 3–14 times longer than broad 42

41. Leaves ± entire, 3.5–14 cm long .... **45. S. ellipticum**
    Leaves conspicuously lobed, 1.2–2.6 cm long .... **41. S. graniticum**

42. Leaves 1.5–4 cm long, lower surface stellae sparse to dense; Co .... **51. S. angustum**
Leaves 7–10.5 cm long, lower surface stellae very dense; Mo, Dd, Bn .... **72. S. limitare**

43. Calyx of basal flower(s) within an inflorescence larger and more prickly, and pedicel(s) thicker, compared to calyces and pedicels of distal flowers .... **84. S. chippendalei**
Each inflorescence with all flowers/fruits having calyces all about the same size and prickliness, and pedicels all about the same thickness 44

44. Leaves linear to lanceolate (l/b ratio 3.8–14) 45
Leaves ovate to broadly ovate (l/b ratio 1.6–2.9) 46

45. Branchlet stellae 0.4–0.5 mm diameter, lateral rays 15–18; calyx stellae with 13–20 lateral rays; anthers 7–9 mm long; seeds brown to black .... **78. *S. elaeagnifolium**
Branchlet stellae 0.7–0.9 mm diameter, lateral rays 8–12; calyx stellae with 6–9 lateral rays; anthers 3.5–5 mm long; seeds pale yellow .... **77. S. esuriale**

46. Branchlet prickles absent; calyx prickles 1–4 .... **46. S. dianthophorum**
Branchlet prickles present; calyx prickles 5–70 47

47. Plants erect, 0.3–0.6 m high; calyx prickles 40–70 48
Plants prostrate or sprawling, 0.1–0.3 m high; calyx prickles 5–40(–50) 49

48. Leaf base cuneate; lower leaf surface rusty; calyx stellae 0.4–0.6 mm diameter .... **48. S. senticosum**
Leaf base obtuse or cordate; lower leaf surface yellowish; calyx stellae 0.7–0.9 mm diameter .... **47. S. crebrispinum**

49. Calyx prickles stout, rigid; branchlets terete; inflorescence 1–9 flowered, rachis prickles present; stalks of stellae on upper leaf surface 0–0.3 mm long .... **45. S. ellipticum**
Calyx prickles flimsy, scarcely rigid; branchlets ridged; inflorescence 9–15 flowered, rachis prickles absent; stalks of stellae on upper leaf surface 0–1.0 mm long .... **49. S. quadriloculatum**

50. Leaves linear to lanceolate (l/b ratio 3.3–15) 51
Leaves ovate, broadly ovate, elliptical or orbicular (l/b ratio 0.8–3.2) 76

51. Leaf upper surface stellae dense to very dense 52
Leaf upper surface stellae absent or density very sparse to moderate 59

52. Calyx lobes elliptical, exceeding mature fruits; central ray of stellae (upper leaf surface) 3–6 times as long as laterals .... **5. S. innoxium**
Calyx lobes deltate to attenuate, not exceeding mature fruits; central ray of stellae (upper leaf surface) absent or up to 1.7 times as long as laterals 53

53. Finger hairs present on calyx and upper leaf surface; bark corky .... **76. S. versicolor**
Finger hairs absent from plant; bark not corky 54

54. Type 2 hairs present on branchlets and lower leaf surface; flowers 4-merous .... **79. S. ammophilum**
Type 2 hairs absent; flowers 5-merous 55

55. Upper leaf surface with stellae 0.4–0.7 mm diameter 56
Upper leaf surface with stellae 0.15–0.4 mm diameter 57

56. Branchlet stellae 0.4–0.5 mm diameter, lateral rays 15–18; calyx stellae with 13–20 lateral rays; anthers 7–9 mm long; seeds brown to black . . . . **78. *S. elaeagnifolium**
    Branchlet stellae 0.7–0.9 mm diameter, lateral rays 8–12; calyx stellae with 6–9 lateral rays; anthers 3.5–5 mm long; seeds pale yellow . . . . **77. S. esuriale**

57. All stellate hairs lacking a central ray; lower leaf surface stellae with 13–16 lateral rays . . . . **80. S. sturtianum**
    All stellate hairs with an obvious central ray; lower leaf surface stellae with 7–9 lateral rays 58

58. Branchlet stellae porrect, central ray 0.3–0.7 times as long as laterals; branchlet prickles 0.5–6 mm long; calyx stellae sessile or stalks to 0.1 mm long . . . . **61. S. intonsum**
    Branchlet stellae porrect to multiradiate, central ray 1–1.5 times as long as laterals; branchlet prickles 6–10 mm long; calyx stellae with stalks 0.1–0.4 mm long . . . . **68. S. jucundum**

59. Fruiting pedicels 5–13 mm long 60
    Fruiting pedicels 13–33 mm long 67

60. Calyx lobes elliptic, exceeding mature fruit 61
    Calyx lobes deltate, rostrate or attenuate, never exceeding mature fruit. 62

61. Upper leaf surface stellae moderate to dense; branchlet stellae 0.25–0.4 mm diameter, central ray 3–4 times as long as laterals; Dd & Ma . . . . **5. S. innoxium**
    Upper leaf surface stellae very sparse to sparse; branchlet stellae 0.6–0.9 mm diameter, central ray 0.4–0.8 times as long as laterals; Mi & Bk . . . . **6. S. ultimum**

62. Upper leaf surface stellae 0.05–0.4 mm apart (moderate density) 63
    Upper leaf surface stellae 0.4–5 mm apart (very sparse to sparse) 66

63. Leaves linear, 0.3–0.6 cm wide . . . . **74. S. galbinum**
    Leaves linear to ovate, 0.7–6.5 cm wide 64

64. Upper leaf surface stellae with lateral rays ascending; inner surface of corolla sparsely stellate-hairy . . . . **61. S. intonsum**
    Upper leaf surface stellae with lateral rays porrect; inner surface of corolla glabrous 65

65. Stellae of upper leaf surface 0.4–0.7 mm across, lateral rays 6–12, central ray 0.5–1 times as long as laterals; common peduncle 14–36 mm long . . **77. S. esuriale**
    Stellae of upper leaf surface 0.15–0.3 mm across, lateral rays 13–15, central ray absent; common peduncle 3–5 mm long . . . . **80. S. sturtianum**

66. Upper leaf surface stellae 0.1–0.2 mm diameter and 0.4–0.7 mm apart; mature fruits 11–16 mm diameter, green . . . . **73. S. amblymerum**
    Upper leaf surface stellae 0.3–0.5 mm diameter and 0.8–5 mm apart; mature fruits 6–8 mm diameter, red . . . . **19a. S. parvifolium** subsp. **parvifolium**

67. Stellate hairs absent from fully expanded leaves . . . . **23. S. lythrocarpum**
    Stellate hairs present on fully expanded leaves 68

68. Lower leaf surface stellae with central ray 1.5–6 times as long as laterals. 69
    Lower leaf surface stellae with central ray 0–1 times as long as laterals 71

69. Leaves 0.3–0.8 cm wide; lower surface green, with stellae 0.3–2 mm apart . . **21. S. latens**
Leaves 0.9–4.5 cm wide; lower surface white, yellowish or rusty, with stellae 0.05–0.2 mm apart 70

70. Petioles 3–7% length of lamina; pedicels 4–7 mm long at anthesis; leaves often with shallow lobes; Cape York Peninsula . . . . . . **10. S. fervens**
Petioles 11–16% length of lamina; pedicels 8–15 mm long at anthesis; leaves entire; Nk, Pc, Wb, Dd, Bn, Mo . . . . . . **18. S. stelligerum**

71. Branchlet stellae 0.7–0.9 mm diameter; common peduncle 14–36 mm long **77. S. esuriale**
Branchlet stellae 0.2–0.6 mm diameter; common peduncle 0–7 mm long 72

72. Upper leaf surface grey-green; herbaceous resprouter; mature fruits green . **72. S. limitare**
Upper leaf surface green; perennial shrubs; mature fruits red 73

73. Leaves lanceolate to ovate, stellae absent from upper surface; mature fruits 10–14 mm diameter; Cape York peninsula only . . . . . . **13. S. discolor**
Leaves linear to narrow-lanceolate; stellae very sparse to moderate on upper surface; mature fruits 5–9 mm diameter; never on Cape York peninsula 74

74. Seeds 3.0–3.6 mm long; prickles present on both leaf surfaces . . . . . . **20. S. ferocissimum**
Seeds 1.9–2.4 mm long; prickles absent from leaves 75

75. Leaves 2.3–7 × 0.5–1.5 cm, Type 2 hairs absent; style 3.8–6.5 mm long; flowers all bisexual . . . . . . **19a. S. parvifolium** subsp. **parvifolium**
Leaves 7–13.7 × 1.3–3.6 cm, Type 2 hairs present; style 6.5–9.0 mm long; male flowers present in the inflorescence . . . . . . **19b. S. parvifolium** subsp. **tropicum**

76. Upper leaf surface with moderate to very dense stellate indumentum 77
Upper leaf surface glabrous or stellate indumentum very sparse to sparse 97

77. Calyx lobes elliptic, exceeding mature fruit; branchlet prickles absent 78
Calyx lobes deltate, rostrate, hemispherical or attenuate, not exceeding mature fruit; branchlet prickles absent or present 83

78. Stellae of branchlets, upper and lower leaf surface, and calyx all sessile 79
At least some stellae on branchlets, leaves and calyx with conspicuous stalks (*i.e.* stalks at least 0.2 mm long, and up to 2 mm long) 81

79. Leaves broadly ovate; petioles 30–55% of lamina length; subshrub 0.1–0.25 m high . . . . . . **4. S. johnsonianum**
Leaves lanceolate to ovate; petioles 11–25% of lamina length; shrubs 0.3–1 m high 80

80. Leaves 2.3–3.5 cm wide; mature fruits globular, 5–6.5 mm diameter; Mo . . **3. S. hapalum**
Leaves 0.8–2 cm wide; mature fruits ellipsoidal, 3–4.5 mm diameter; Ma, Dd **5. S. innoxium**

81. Some stellae of branchlets, leaves and calyx with gland-tipped central ray; leaves usually slightly lobed; ovary glabrous . . . . . . **9. S. gympiense**
No stellae with gland-tipped central ray; leaves entire; ovary with stellate or Type 2 hairs 82

82. Stellae of upper leaf surface with 4–6 lateral rays, central ray 3–6 times as long as laterals, stalks absent . . . . . . **7. S. densevestitum**
Stellae of upper leaf surface with 7 or 8 lateral rays, central ray 0.7–1.8 times as long as laterals, stalks 0.1–0.3 mm long . . . . . . **8. S. nemophilum**

83. Leaves 0.8–1.7 times longer than broad 84
Leaves 1.7–3.2 times longer than broad 88

84. Lamina 1–2.5 cm long, petioles 0.1–0.3 cm long; stellae of upper surface with 12–16 lateral rays . . . . **81. S. oligacanthum**
Lamina 3.5–35 cm long, petioles 0.9–7.2 cm long; stellae of upper surface with 4–10 lateral rays 85

85. Stellae of upper leaf surface with central ray 4–10 times as long as laterals; mature fruits conspicuously tomentose, 25–35 mm diameter . . . . **32. S. lasiocarpum**
Stellae of upper leaf surface with central ray 0.8–3 times as long as laterals; mature fruits glabrous, 8–17 mm diameter 86

86. Branchlet prickles straight, acicular, 10–17 times longer than broad; inflorescence unbranched or flowers solitary, 1–4 flowered . . . . **52. S. argopetalum**
Branchlet prickles curved, broad-based, 1.5–3 times longer than broad; inflorescence branched, 13–65 flowered 87

87. Finger hairs absent from calyx and pedicels; new growth rusty . . . . **30. *S.chrysotrichum**
Finger hairs present on calyx and pedicels; new growth white or grey . . . . **31. *S. torvum**

88. Leaves 0.5–1.5 cm long . . . . **75. S. elachophyllum**
Leaves 2.5–16.5 cm long 89

89. Branchlet prickles 0–20 per dm 90
Branchlet prickles 21–1400 per dm 95

90. Calyx with Type 2 hairs or finger hairs (as well as stellate hairs); bark corky 91
Calyx with stellate hairs only; bark not corky, non-descript 92

91. Calyx with stellate hairs and Type 2 hairs; shrub 1–3 m high . . . . **62. S. furfuraceum**
Calyx with stellate hairs and finger hairs; subshrub 0.1–0.3 m high . . . . . **76. S. versicolor**

92. Subshrubs 0.3–0.6 m high, herbaceous resprouters . . . . **69. S. centrale**
Shrubs 0.6–2 m high, perennials 93

93. Stellae stalks (branchlets and calyx) up to 2.2 mm long; corolla rotate; common peduncle 15–33 mm long . . . . **67. S. cocosoides**
Stellae stalks (branchlets and calyx) up to 0.4 mm long; corolla shallowly or deeply lobed; common peduncle 0–12 mm long 94

94. Type 2 hairs absent from upper leaf surface; branchlet stellae with porrect lateral rays; stellae of lower leaf surface 0.4–0.6 mm diameter . . . . **61. S. intonsum**
Type 2 hairs present on upper leaf surface; branchlet stellae with lateral rays porrect, ascending, or multiradiate; stellae of lower leaf surface 0.2–0.4 mm diameter . . . . **68. S. jucundum**

95. Branchlet prickles broad, recurved, 1–2.5 times longer than broad . . . . **54. S. hamulosum**
Branchlet prickles acicular, straight, 10–20 times longer than broad. 96

96. Inflorescence 1 or 2 flowered; branchlet prickles 30–160 per dm; prickles absent from leaves . . . . **50. S. crassitomentosum**
Inflorescence 7–25 flowered; branchlet prickles 240–1400 per dm; prickles present on both leaf surfaces . . . . **28. S. mitchellianum**

97. Leaves 0.5–1.5 × 0.3–0.7 cm . . . . **75. S. elachophyllum**
Leaves 2.5–26 × 0.9–19 cm 98

98. Plants prostrate, stoloniferous, rooting at the nodes 99
Plants erect or sprawling, but not prostrate or stoloniferous 101

99. Stellae of lower leaf surface lacking a central ray; mature fruits red ..... **15. S. mentiens**
Stellae of lower leaf surface with clearly visible central ray; fruits green to yellowish-green 100

100. Stellae of branchlets with central ray 0.5–1.5 times as long as laterals; upper leaf surface with 20–60 prickles; prickles present on lower leaf surface .... **60. S. acanthodapis**
Stellae of branchlets with central ray 4–9 times as long as laterals; upper leaf surface with 0–8 prickles; lower leaf surface without prickles ..... **59. S. serpens**

101. Calyx lobes elliptic and exceeding mature fruit; large stems without prickles .... **6. S. ultimum**
Calyx lobes deltate, rostrate or attenuate, not exceeding mature fruit; at least large stems with some prickles 102

102. Calyx and pedicel with finger hairs 103
Finger hairs absent from calyx and pedicel 105

103. Leaves 1.1–1.5 times longer than broad, lower surface white .... **31. *S. torvum**
Leaves 1.9–2.7 times longer than broad, lower surface green 104

104. Calyx lobes 2–3.5 mm long at anthesis; fruiting pedicels *c.* 15 mm long; lower leaf surface with 11–17 prickles; Co .... **25. S. dysprosium**
Calyx lobes 4–9 mm long at anthesis; fruiting pedicels 26–38 mm long; lower leaf surface with 0–9 prickles; Mo .... **26. S. inaequilaterum**

105. Stellate hairs absent from petioles and *lower* surface of fully expanded leaves; inflorescences mostly branched; branchlet prickles absent 106
Stellate hairs present on petioles or *lower* surface of fully expanded leaves; inflorescences mostly unbranched; branchlet prickles usually present 107

106. Petioles 7–10% of lamina length; common peduncle 5–8 mm long; calyx densely stellate-hairy, stellae with central ray deflexed; style 7–8 mm long .... **1. S. dunalianum**
Petioles 17–30% of lamina length; common peduncle 12–23 mm long; calyx sparsely stellate-hairy, stellae with central ray erect; style 4.5–5.5 mm long .... **2. S. viridifolium**

107. Branchlet prickles present, curved, broad-based, 1–5 times longer than broad 108
Branchlet prickles absent or present (and then straight, 6–20 times longer than broad) 110

108. Leaves 9–19 cm wide; branchlet stellae on thick stalks 0.1–1 mm long; inflorescence 3 or 4 branched (paniculate) .... **30. *S. chrysotrichum**
Leaves 4.5–7.5 cm wide; branchlet stellae sessile or with short thready stalks; inflorescences pseudo-racemose 109

109. Leaves 1.9–2.5 times longer than broad, entire or with obtuse lobes; stellae of branchlets and lower leaf surface lacking a central ray .... **53. S. dimorphispinum**
Leaves 1.4–1.8 times longer than broad, with acute lobes; stellae of branchlets and lower leaf surface with central ray 0.3–0.6 times as long as laterals .... **55. S. eminens**

110. Branchlets with corky outgrowths, large stems very corky 111
Branchlets without corky outgrowths, large stems not corky 112

111. No finger hairs on upper leaf surface; stellae of lower leaf surface with central ray 0.3–0.7 times as long as laterals; leaves consistently lobed . . . . **63. S. sporadotrichum**
Finger hairs present on upper leaf surface; stellae of lower leaf surface with central ray 1–2 times as long as laterals; leaves usually entire **62. S. furfuraceum**

112. All stellae on lower leaf surface stalked (stalks 0.15–0.6 mm long) 113
Some or all stellae on lower leaf surface sessile 114

113. Stellae on upper leaf surface absent or confined to midrib; mature fruits red, 6–7 mm diameter . . . . **17. S. dryanderense**
Stellae distributed throughout upper leaf surface; mature fruits yellowish-green to green, 19–24 mm diameter . . . . **58. S. rixosum**

114. Stellae of lower leaf surface with central ray absent or up to 0.6 times as long as laterals 115
Stellae of lower leaf surface with central ray 0.7–6 times as long as laterals 119

115. Lower leaf surface white to yellowish, stellae dense to very dense 116
Lower leaf surface green, stellae very sparse to moderate 118

116. Stellae of lower leaf surface without a central ray . . . . **14. S. corifolium**
Stellae of lower leaf surface with central ray 0.1–0.5 times as long as laterals 117

117. Lower leaf surface stellae very dense, *c.* 0.05 mm apart . . . . **13. S. discolor**
Lower leaf surface stellae dense, 0.1–0.3 mm apart . . . . **11. S. yirrkalense**

118. Petioles 0.6–1 cm long; stellae absent from upper leaf surface, 0.4–0.6 mm diameter on lower surface; pedicels 0.15–0.25 mm thick at anthesis; Cape York . . . . **12. S. defensum**
Petioles 1.4–2.6 cm long; stellae present on upper leaf surface, 0.2–0.3 mm diameter on lower surface; pedicels 0.4–0.7 mm thick at anthesis; Wet Tropics . . . . **56. S. macoorai**

119. Branchlet prickles 30–1400 per dm; petiole prickles present 120
Branchlet prickles 0–25 per dm; petioles without prickles 121

120. Branchlet prickles 240–1400 per dm; lamina base obtuse to cordate; inflorescence 7–25 flowered; mature fruits black, 8–9 mm diameter . . . . **28. S. mitchellianum**
Branchlet prickles 30–70 per dm; lamina base cuneate; inflorescence 1–3 flowered; mature fruits green, 16–19 mm diameter . . . . **65. S. dumicola**

121. Some leaves shallowly lobed 122
All leaves entire 123

122. Petioles 0.4–0.8 cm long; calyx lobes 0.5–1.2 mm long at anthesis; mature fruits red, 9–12 mm diameter . . . . **10. S. fervens**
Petioles 1–3.5 cm long; calyx lobes 3–4 mm long at anthesis; mature fruits yellowish-green to yellow, 20–27 mm diameter . . . . **57. S. magnifolium**

123. Pedicels 0.8–1.3 mm thick at midpoint; inner surface of corolla stellate-hairy; fruits 4-locular . . . . **66. S. tetrathecum**
Pedicels 0.2–0.7 mm thick at midpoint; inner surface of corolla glabrous; fruits 1-locular 124

124. Stellae of lower leaf surface all sessile, stellae 0.1–0.3 mm apart; mature fruits 3.5–6 mm diameter; petioles 5–12% of lamina length . . . . . . **16. S. shirleyanum**
Lower leaf surface with some long-stalked stellae (to 0.6 mm long), stellae 0.05–0.1 mm apart; mature fruits 6.5–9 mm diameter; petioles 11–16% of lamina length . . . . **18. S. stelligerum**

Synoptic key to *Solanum* subg. *Leptostemonum*, using characters applicable to live material

Notes on the use of this key: Look through the list of characters and character states below. Choose applicable character states that are not commonly occurring. For example, if your specimen has orange fruits, then fruit colour will be a good character to use, because only 5 species have orange fruits. Write down all the numbers adjacent to the first character state you chose. Choose a second character, decide on the correct state, and write down the numbers adjacent to that state. Circle the numbers that are common to the two lists. Select a third character, decide on the correct state, and write down the numbers adjacent to that state. Circle the numbers that are common to all three lists. Continue in this way until you reach a single number, and then match that number with the species name in the list appearing directly below the key.

Character	Character State	Taxa possessing that state
Habit	herbaceous resprouter	34–36, 38–46, 49, 51, 52, 66, 69, 72, 76–79, 81, 89
	prostrate stoloniferous	15, 59, 60
	rhizomatous shrub	1–14, 16–33, 45–50, 53, 56–58, 61–64, 67, 68, 70, 71, 73–75, 80–90
	vine or shrubby vine	46, 53–55
Bark	corky	50, 62, 63, 76
	non-descript	most species
Prickles, large stems	absent	1, 3–9, 46
	curved, broad based (1–4 times longer than wide)	24, 30, 31, 53–55, 87, 90
	straight, broad based (4–7 times longer than wide)	2, 16, 24, 31, 32, 43, 44, 61, 64, 67, 68, 71, 78–80, 83, 88–90
	Straight, acicular (7–20 times longer than wide)	10–14, 15–23, 25–29, 32–45, 47, 49–52, 56–58, 60, 62–66, 68–78, 81–86, 89
Adult leaves (length-breadth ratio)	0.8–1.7	4, 7, 9, 15, 22, 24, 27–29, 30–39, 40, 41, 44–45, 47, 49, 50, 52, 54, 55, 59, 60, 63, 65, 70, 71, 75, 81–83, 86–90
	1.8–3	1–18, 22, 24–26, 28, 29, 30, 34, 36–43, 45–51, 53–71, 75, 76, 82–86, 88–90
	3.1–26	1, 5, 6, 10, 12, 13, 17–19, 20, 21, 23, 42, 51, 56, 61, 66, 68, 72–74, 76–80, 84

Lower leaf surface (density of stellate hairs)	absent	1, 2, 22, 23, 27, 33, 38, 39, 44
	very sparse	12, 21, 27, 35, 37, 42, 56
	sparse	12, 20, 21, 26, 34–37, 40–42, 51, 56, 60, 75, 88
	moderate	12, 20, 21, 25, 26, 30, 34–36, 40–42, 51, 56, 57, 59, 60, 63, 64, 75, 88–90
	dense	3, 4, 6–11, 16–18, 20, 24, 29–32, 36, 45, 47, 48, 50–52, 54, 55, 57–63, 65, 66, 75–77, 79, 82–84, 86, 87, 89
	very dense	3–6, 8, 9, 13, 14, 15, 18–20, 24, 28, 29, 32, 43, 45–50, 53, 55, 57, 59, 60, 67–74, 76–82, 84, 85
Corolla colour	white	2, 11, 12, 14, 15, 18, 20, 26, 30–33, 36, 39, 40, 45, 50, 52, 64, 74, 76, 90
	yellow	89
	mauve or purple	most species
Mature fruit colour (or predominant colour)	red	1–24, 26, 56, 90
	black	27–29
	green to yellowish-green	30, 31, 34, 35, 38–41, 45, 47–52, 54, 57–68, 70, 71–77, 79, 84
	yellow	44, 53, 57, 80, 81, 87, 88
	orange	32, 33, 55–56, 86
	brown	44, 80–83
	purple	37
Mature fruit diameter (fresh)	3–9.0 mm	1–10, 14, 16–25, 27, 28, 44, 46, 80, 81, 89
	9.1–13.0 mm	10, 12–15, 23, 26, 29, 31, 35, 42–46, 48, 54, 63, 66, 73–81, 89
	13.1–16.0 mm	11–13, 30, 31, 36, 39–41, 43, 45, 47–52, 54, 59–62, 64–68, 72–75, 77, 78, 82, 90
	16.1–45 mm	12, 31–34, 36, 37, 45, 49–51, 53, 55–58, 60–62, 64–67, 70–72, 82, 84–88, 90
Calyx prickle number	zero	most species
	1–35	29, 33, 35, 38–46, 49, 51, 60, 64, 70–72, 77, 78, 83–88, 90
	36–600	34, 36–38, 41, 42, 45, 48, 49, 70, 82–85, 88, 90
Seed colour (fresh)	white to pale yellow	most species
	brown to black	27, 28, 32, 50, 66–68, 70, 75, 78, 80–82, 84, 86–89
Distribution (Pastoral district)	Mo or Wb or NE NSW	3, 7–9, 14–16, 18, 26, 29–31, 33, 34, 37, 45, 58–60, 66, 72, 73, 78, 86, 88, 89
	Dd	5, 8, 14, 18–21, 27–29, 34, 37, 38, 42, 45, 58, 66, 68, 70–73, 77, 78, 86, 89, 90
	Bn or Pc	2, 4, 8, 9, 14, 18, 19, 21–23, 28, 30, 31, 33, 42, 45, 46, 58, 62, 66, 68, 72, 77, 78, 86, 87, 89
	Le or Sk	2, 4, 7–9, 19–22, 27, 28, 31, 33, 39–41, 45, 47, 62–65, 67, 68, 74, 75, 77, 88

Nk	2, 14, 17–19, 31, 35, 36, 41, 45, 50, 54, 56, 57, 62, 63, 74, 77
Co	1, 2, 10–14, 19, 25, 31–33, 35, 36, 44, 45, 51, 53, 54–57, 61, 74, 83, 85
Ma, Wa, Gs, Gn, Mi or Bk	5, 6, 9, 19, 20, 24, 28, 31, 43–45, 48–50, 52, 62, 65, 67–69, 74, 76, 77, 79–85

01.	*S. dunalianum*
02.	*S. viridifolium*
03.	*S. hapalum*
04.	*S. johnsonianum*
05.	*S. innoxium*
06.	*S. ultimum*
07.	*S. densevestitum*
08.	*S. nemophilum*
09.	*S. gympiense*
10.	*S. fervens*
11.	*S. yirrkalense*
12.	*S. defensum*
13.	*S. discolor*
14.	*S. corifolium*
15.	*S. mentiens*
16.	*S. shirleyanum*
17.	*S. dryanderense*
18.	*S. stelligerum*
19.	*S. parvifolium*
20.	*S. ferocissimum*
21.	*S. latens*
22.	*S. dissectum*
23.	*S. lythrocarpum*
24.	*S. chenopodinum*
25.	*S. dysprosium*
26.	*S. inaequilaterum*
27.	*S. coracinum*
28.	*S. mitchellianum*
29.	*S. semiarmatum*
30.	*S. chrysotrichum*
31.	*S. torvum*
32.	*S. lasiocarpum*
33.	*S. capsicoides*
34.	*S. ditrichum*
35.	*S. cookii*
36.	*S. multiglochidiatum*
37.	*S. vicinum*
38.	*S. papaverifolium*
39.	*S. adenophorum*
40.	*S. pusillum*
41.	*S. graniticum*
42.	*S. stenopterum*
43.	*S. lacunarium*
44.	*S. pugiunculiferum*
45.	*S. ellipticum*
46.	*S. dianthophorum*
47.	*S. crebrispinum*
48.	*S. senticosum*
49.	*S. quadriloculatum*
50.	*S. crassitomentosum*
51.	*S. angustum*
52.	*S. argopetalum*
53.	*S. dimorphispinum*
54.	*S. hamulosum*
55.	*S. eminens*
56.	*S. macoorai*
57.	*S. magnifolium*
58.	*S. rixosum*
59.	*S. serpens*
60.	*S. acanthodapis*
61.	*S. intonsum*
62.	*S. furfuraceum*
63.	*S. sporadotrichum*
64.	*S. francisii*
65.	*S. dumicola*
66.	*S. tetrathecum*
67.	*S. cocosoides*
68.	*S. jucundum*
69.	*S. centrale*
70.	*S. cinereum*
71.	*S. nobile*
72.	*S. limitare*
73.	*S. amblymerum*
74.	*S. galbinum*
75.	*S. elachophyllum*
76.	*S. versicolor*
77.	*S. esuriale*
78.	*S. elaeagnifolium*
79.	*S. ammophilum*
80.	*S. sturtianum*
81.	*S. oligacanthum*
82.	*S. echinatum*
83.	*S. longissimum*
84.	*S. chippendalei*
85.	*S. carduiforme*
86.	*S. stupefactum*
87.	*S. incanum*
88.	*S. linnaeanum*
89.	*S. rostratum*
90.	*S. sisymbriifolium*

Solanum subg. Leptostemonum (Dunal) Bitter, Bot. Jahrb. Syst. 55: 68 (1919); *S.* sect. *Leptostemonum* Dunal in A.DC., Prodr. 13(1): 183 (1852). **Type:** *S. mammosum* L., lecto, *fide* D'Arcy, Ann. Missouri Bot. Gard. 59: 270 (1973).

Herbaceous resprouters, perennial vines, shrubs, or small trees. **Prickles usually present** on stems and petioles, sometimes on leaves and calyces, rarely on corolla, but in a very few species absent altogether. **Stellate hairs usually present** on many parts of the plant, rarely absent. Leaves often having two distinct ontogenetic stages. Juvenile leaves larger, more deeply lobed and more prickly. Adult leaves usually two per sympodial unit (in Queensland), entire or variously lobed, the base oblique on all or some leaves. Inflorescence cymose, often appearing racemose or paniculate, or reduced to a single flower. All flowers bisexual, or distal flowers functionally male (andromonoecious), or rarely dioecious. Flowers actinomorphic (in Queensland), mostly 5-merous, some species always or predominantly 4-merous. Calyx fused, often accresent in fruit. Corolla lobes fused, variously lobed. Stamens equal in size and shape (in Queensland); **anthers attenuate,** yellow, glabrous (in Queensland), dehiscing by terminal pores. Ovary 1–4-locular, the placenta variously lobed. Fruit a juicy or mucilaginous (rarely dry) berry; stone cells absent. Seeds lenticular, subreniform, the testa with fine reticulated ornamentation.

About 500 species, throughout the world, mainly in tropical and subtropical regions.

Group 5 (S. dunalianum group) of Whalen (1984)

Large shrubs or small trees (100%); adult leaves entire (100%); branchlet prickles absent (100%); Stem prickles sparse, broad-based (100%); stellate hairs present only on young vegetative growth and inflorescences (100%); flowers all bisexual (100%); flowers often 4-merous (100%); mature fruits red, juicy, succulent, 1-locular, <9 mm diameter, exocarp <0.5 mm thick (100%); inflorescences 2–3-branched (83%).

c. 15 species extending from Malesia to the western Pacific. 3 species indigenous to Australia, 2 species indigenous to Queensland.

The species allied to *S. vaccinioides* (all endemic to New Caledonia) were included in this group by Whalen (*loc. cit.*). However they seem to have little in common with *S. dunalianum* and related species.

1. Solanum dunalianum Gaudich. in Freyc., Voyage Uranie 448 (1829), t. 58 (1828). **Type:** Moluccas, Pisang, [December 1818], *C. Gaudichaud-Beaupré s.n.* (lecto: P), here designated.

***Illustration*:** Symon (1981: 119)

Erect, rhizomatous perennial shrub, 2–4 m high. Leaves (in outline) ovate, entire; lamina *c.* 35 × 15 cm, without prickles on upper surface. Adult branchlets brown; prickles absent; stellae absent or sparse, 0.25–0.35 mm diameter, sessile; lateral rays 7–9, porrect; central ray 0.4–0.8 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Adult leaves* elliptical or ovate, entire; lamina 13–23 cm long, 4.3–7.5 cm wide, 2.8–3.1 times longer than broad, apex acute, base cuneate, oblique part 0–15 mm long, obliqueness index 0–9 percent; petioles 1–1.8 cm long, 7–10% length of lamina, prickles absent. *Upper leaf surface* green; prickles absent; stellate hairs absent, or confined to midrib; ordinary stellae absent from surface; finger hairs absent; Type 2 hairs absent. *Lower leaf surface* green; prickles absent; stellae absent; finger hairs absent; Type 2 hairs absent. *Inflorescence* supra-axillary, 2-branched, common peduncle 5–8 mm long, rachis prickles absent; 15–25-flowered, with all flowers bisexual and 4 or 5-merous; pedicels 4–7 mm long at anthesis, markedly thicker distally, 0.4–0.7 mm thick at mid-point, prickles absent. Calyx tube 1.5–2 mm long, lobes deltate, 0.3–1 mm long; prickles absent at anthesis; stellae sparse to very dense, yellow or white, 0.15–0.25 mm across, sessile, lateral rays 7–9, central ray 0.6–1.2 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. Corolla mauve, 7–9 mm long, deeply lobed, inner surface sparsely stellate-hairy; anthers 4.5–5.5 mm long; ovary glabrous; functional style 7–8 mm long, erect, with stellate hairs only, stellae 0.25–0.3 mm across, lateral rays 8–11, central ray 0.5–0.8 times as long as laterals. *Fruiting calyx* with lobes less than half length of mature fruit, prickles absent. Mature fruits 3–13 per inflorescence, globular, 8–9 mm diameter, red, 1-locular (septum absent or incomplete); mesocarp juicy, succulent; pedicels 8–16 mm long in fruit, 0.8–1 mm thick at mid-point; seeds pale yellow, 2–2.7 mm long.

Specimens examined**: Queensland.** Cook District: Embley River, 10 miles [16 km] S of Weipa, Aug 1974, *Swan* 141 (AD, BRI, CANB); Weipa South, behind old airstrip, Jul 1980, *Tucker* AM762 (BRI); Possum Scrub, Jun 1994, *Forster* PIF15276 & *Tucker* (AD, BRI).

Distribution and habitat**:** In Queensland, *Solanum dunalianum* is known only from the vicinity of Weipa on Cape York Peninsula (**Map 1**). Also known from Malesia (New Guinea and some nearby islands). Queensland specimens are recorded from the edges of semi-deciduous rainforest, on 'red lateritic ridges'.

Phenology: Both flowers and mature fruits have been recorded for June, July and August.

Notes: *S. dunalianum* is close to *S. viridifolium*, but *S. dunalianum* in Australia has young leaves and petioles with stellate hairs (*vs.* glabrous for *S. viridifolium*); petioles 7–10% of lamina length (*vs.* 15–30% for *S. viridifolium*); common peduncle 5–8 mm long (*vs.* 12–23 mm long for *S. viridifolium*); pedicels and calyx densely to very densely stellate hairy (*vs.* glabrous or sparsely stellate-hairy); central ray of stellae deflexed (*vs.* erect) and style 7–8 mm long (*vs.* 4.5–5.5 mm for *S. viridifolium*).

There are two sheets of *S. dunalianum* at P that were collected by Charles Gaudichaud-Beaupré. The sheet with 5 leaves and the prickly stem, with the label saying "Solanum dunalianum, Aquartia Dl, Ile Pisang, C.G." is chosen as lectotype, as that specimen more closely matches the protologue.

I am uncertain about the correct application of the name *S. dunalianum*. The Australian species is perhaps referable to *S. torricellense* Bitter, but further taxonomic study is required.

Conservation status: Currently listed as "Vulnerable" under the Queensland Nature Conservation Act, 1992. *S. dunalianum* is known from only 3 locations, none of which is in a conservation reserve. Applying the IUCN criteria (IUCN. 2001), the existing category of "Vulnerable" is endorsed (VU C1).

2. Solanum viridifolium Dunal in A.DC., Prodr. 13(1): 73 (1852). **Type:** [Queensland. Cook District:] near Cape Grafton, 9 June 1770, *J. Banks & D. Solander* (holo: BM).

S. viride R.Br., Prodr. 445 (1810), *nom. illeg., non* G.Forst. ex Spreng. (1807).

Illustration**:** Symon (1981: 123), as *S. viride*

Erect, rhizomatous perennial shrub, 1.5–9 m high. Juvenile branchlets with 0–10 prickles per dm, 1–3 mm long; leaves (in outline) ovate, entire; lamina 9–14 cm long, 4–6 cm wide, without prickles on upper surface. Adult branchlets brown or green; prickles absent (but large stems prickly); stellae absent; finger hairs absent; Type 2 hairs absent. *Adult leaves* ovate, entire; lamina 5–18.5 cm long, 2–6.5 cm wide, 2.1–2.9 times longer than broad, apex acute or acuminate, base cuneate, oblique part 0–8 mm long, obliqueness index 0–4 percent; petioles 1.2–3.8 cm long, 15–30% length of lamina, prickles absent. *Upper leaf surface* green; prickles absent; stellate hairs absent, or confined to midrib; ordinary stellae absent from surface; finger hairs absent; Type 2 hairs absent. *Lower leaf surface* green; prickles absent; stellae absent; finger hairs absent; Type 2 hairs absent. *Inflorescence* supra-axillary, pseudo-racemose or 2–3-branched, common peduncle 12–23 mm long, rachis prickles absent; 12–60-flowered, with all flowers bisexual and 4 or 5-merous; pedicels 5–13 mm long at anthesis, markedly thicker distally, 0.4–0.7 mm thick at mid-point, prickles absent. Calyx tube 1–2 mm long, lobes elliptic or deltate, 0.5–1.5 mm long; prickles absent at anthesis; stellae sparse, white, 0.2–0.3 mm across, sessile, lateral rays 4–8, central ray 0.5–1 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. Corolla white, mauve or purple, 6–11 mm long, deeply lobed, inner surface sparsely to densely stellate-hairy; anthers 3.5–5 mm long; ovary with Type 2 hairs only; functional style 4.5–5.5 mm long, erect, glabrous or with stellate and Type 2 hairs, stellae *c.* 0.3 mm across, lateral rays 4–6, central ray 1.5–2 times as long as laterals. *Fruiting calyx* with lobes less than half length of mature fruit, prickles absent. Mature fruits 3–13 per inflorescence, globular, 5.5–7.5 mm diameter, red, 1-locular (septum absent or incomplete); placenta not apparent; mesocarp juicy, succulent; exocarp 0.1–0.3 mm thick; pedicels 11–17 mm long in fruit, 0.6–0.8 mm thick at mid-point; seeds pale yellow, 2–3 mm long.

***Specimens examined*:** **New Guinea.** Sabi, lower Wassi Kussa River, Jun 1973, *Henty* NGF 49646 (A, BRI, CANB, L); near Kunini village, Daru district, May 1986, *Simaga* 768 (CANB). **Queensland.** Cook District: Boolally, Upper Barron R., Jun 1899, *J.F. Bailey s.n.* (BRI); S.F.185 Danbulla, Sep 1929, *Doggrell* A12 (BRI); Mt Spurgeon, Sep 1936, *White* 10719 (BRI); Etty Bay, Dec 1941, *White* 11734 (BRI); Brown's Creek, Pascoe River, Jul 1948, *Brass* 19589 (BRI, CANB); Hammond Island, Jul 1974, *Heatwole* 303 (BRI); Halloran's Hill, Atherton, Aug 1975, *Stocker* 1420 (BRI, QRS); T.R.14, McIlwraith Range–Leo Ck road, Sep 1975, *Hyland* 8431 (BRI, CANB, QRS); Thursday Island, May 1977, *Paton* 10 (CANB); S.F.194, Baldy Mountain S.F., Oct 1987, *Foreman* 1649 (AD, BRI, CANB, NSW, QRS); Garraway Hill, 12° 42'S 143° 08'E, Jul 1993, *Forster* PIF13540 & *Tucker* (AD, BRI, MEL, QRS); Mt Misery, S of Cooktown, Sep 2000, *McDonald* KRM593 & *Hines* (BRI). North Kennedy District: Dunk Island, undated, *Banfield s.n.* (BRI); S bank of Tully River, Feb 1965, *Everist* 7795 (BRI); Edmund Kennedy N.P., near Cardwell, Dec 1991, *Bean* 3858 (AD, BRI); Kirrama Range, 18.5 km from Kennedy, Dec 1993, *Forster* PIF14314 (BRI). South Kennedy District: Mackay, Oct 1887, *Griffith s.n.* (BRI); S.F.. 652 Cauley, Jul 1974, *Hyland* 7382 (CANB); Mt Blackwood, Mar 1987, *Thompson* 80 (BRI); Crediton S.F., S of Eungella N.P., Nov 1990, *Bean* 2545 (BRI). Port Curtis District: Bobby Range road, S.F.67 Bulburin, E of Builyan, Mar 1995, *Bean* 8444 (BRI).

***Distribution and habitat*:** *Solanum viridifolium* is distributed along the coast of Queensland, north from about Monto (**Map 1**). It also extends to southern New Guinea. It inhabits notophyll rainforests in high rainfall areas, especially at altitudes above 300 metres, but also on the lowlands. A very common and widespread species.

***Phenology*:** Flowers and fruits may be found at any time of the year.

***Notes*:** Young plants of *S. viridifolium* are frequently monopodial until about 1.5 metres in height. Adult plants sometimes have short broad-based prickles on the large stems, although the flowering branchlets are invariably unarmed. One specimen label (*Gray* 2156) records a plant 9 metres high and 15 cm diameter at breast height. This is the tallest recorded *Solanum* in Australia.

Robert Brown collected this species on or near Curtis Island (near Gladstone) in 1802. It has never been recorded near Gladstone since then.

***Conservation status*:** Widespread. Not considered at risk.

Group 9A (S. densevestitum group), here defined; related to Group 9 (*S. jubae* group) of Whalen (1984).

Calyx lobes elliptical, exceeding mature fruits (100%); large stems without prickles (100%); branchlet prickles absent (100%); calyx prickles absent (100%); corolla inner surface glabrous (100%); mature fruits red, juicy, succulent, 1-locular, <9 mm diameter, exocarp <0.5 mm thick (100%); seeds pale yellow, 2–3 mm long (100%); adult leaves entire (93%); inflorescence with all flowers bisexual (93%); inflorescence solitary or pseudo-umbellate (71%); upper leaf surface stellae with central ray 2–9 times as long as laterals (71%).

7 species endemic to Australia; 7 species occurring in Queensland.

Solanum densevestitum and its allies form a very distinctive group. They appear to be closely related to Whalen's Group 9, the African *Solanum jubae* group, because of "the absence of prickles, stellae with long central rays, umbel-like inflorescence, ovate or obovate calyx lobes, and the succulent red fruits" (Whalen 1984: 227–8).

3. Solanum hapalum A.R.Bean **sp. nov.** Frutex usque ad 1 m altus, aculeis carens; folia integra, ovata, indumento coacto; stellae sessiles, radio centrali longo, in pagina inferiore folii 0.4–0.5 mm diametro; fructus globulares succosi et laete rubri maturitate; lobi calycis elliptici, fructus superantes. **Typus:** New South Wales. North Coast: 2.3 km along Dingo Range road, Clouds Creek State Forest, north of Dorrigo, 9 September 2000, *A.R. Bean* 16862 (holo: BRI (1 sheet + spirit); iso: MEL, NE, NSW)

***Illustration*:** Symon (1981: 143), as *S. densevestitum.*

Erect, rhizomatous perennial shrub, 0.5–1 m high. Juvenile branchlets without prickles; entire or shallowly-lobed. Adult stem prickles absent. Adult branchlets yellow or brown; prickles absent; stellae very dense, 0.3–0.4 mm

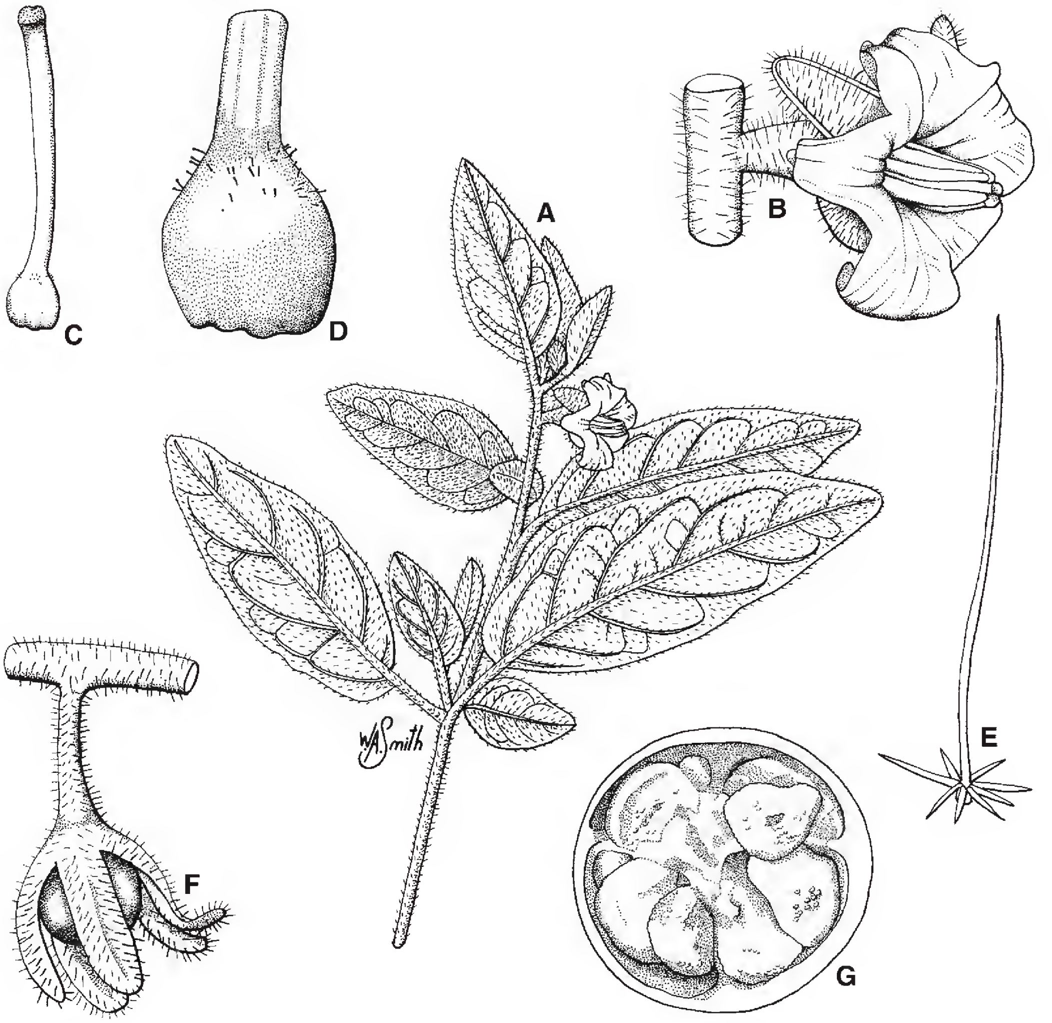


Fig. 13. ***Solanum hapalum***. A. flowering branchlet × 1. B. flower × 3. C. style and ovary × 6. D. ovary showing Type 2 hairs × 20. E. stellate hair from upper leaf surface × 60. F. mature fruit × 2. G. transverse section of fruit × 6. all from *Bean* 16854.

diameter, stalks 0–0.1 mm long; lateral rays 7 or 8, porrect; central ray 3–7 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Adult leaves* ovate, entire; lamina 4.5–7 cm long, 2.3–3.5 cm wide, 1.9–2.5 times longer than broad, apex obtuse or acute, base obtuse or cordate, oblique part 1–4 mm long, obliqueness index 2–6 percent; petioles 0.8–1.7 cm long, 17–25% length of lamina, prickles absent. *Upper leaf surface* grey-green; prickles absent; stellate hairs distributed throughout; protostellae absent; ordinary stellae density moderate to dense, 0.15–0.3 mm apart, 0.25–0.4 mm across, sessile; lateral rays 6–8, porrect; central ray 4–9 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Lower leaf surface* white or yellowish; prickles absent; stellae dense to very dense, 0.1–0.2 mm apart, 0.4–0.5 mm diameter, sessile; lateral rays 7 or 8, porrect; central ray 3–5 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Inflorescence* supra-axillary, solitary or pseudo-umbellate, common peduncle absent; 1–3-flowered, with all flowers bisexual and 5-merous; pedicels 2–7 mm long at anthesis, same thickness throughout, 0.6–0.7 mm thick at mid-point, prickles absent. Calyx tube 1–1.5 mm long, lobes elliptic, 4.5–8 mm long; prickles absent at anthesis; stellae very dense, transparent, 0.3–0.5 mm across, stalks 0–0.1 mm long, lateral rays 7 or 8, central ray 3–5 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. Corolla mauve, 7–12 mm long, shallowly lobed, inner surface glabrous; anthers 4–5 mm long; ovary with Type 2 hairs only; functional style 5–8 mm long, erect, glabrous or with Type 2 hairs only. *Fruiting calyx* with lobes exceeding mature fruit, prickles absent. Mature fruits 1 or 2 per inflorescence, globular, 5–6.5 mm diameter, red, 1-locular (septum absent or incomplete); placenta not apparent; mesocarp juicy, succulent; exocarp 0.2–0.4 mm thick; pedicels 8–11 mm long in fruit, 0.7–1 mm thick at mid-point; seeds pale yellow, 2.2–2.5 mm long. **Fig. 13.**

***Specimens examined*: Queensland.** MORETON DISTRICT: Mt Lindesay, Oct 1921, *White* 1121 (BRI); Border road 4 km S of the sawmill on Burnett Ck, close to N.S.W. border, Apr 1973, *Sharpe* 447 (BRI); Mt Barney, south slopes, Oct 1992, *Forster* 11857 *et al.* (AD, BRI). **New South Wales.** NORTHERN TABLELANDS: 30 miles [48 km] NE of Glen Innes, Gibraltar S.F., Apr 1956, *Constable* (NSW); Gibraltar Range N.P., 68 km E of Glen Innes, Oct 1969, *Coveny* 2243a (NSW); Surface Hill, ESE of Tenterfield, Jan 1975, *Moriarty* 1640 (BRI, CANB). NORTH COAST: F.R. 121 Raleigh, Bellinger R., Apr 1910, *Swain* 157 (NSW); Coffs Harbour, Jun 1911, *Boorman* (BRI, NSW); Taree, Apr 1951, *Noonan* (NSW); 3 miles [5 km] W of Drake, Girard S.F., Apr 1956, *Constable s.n.* (NSW); North Obelisk, 2 km SW of Urbenville, Dec 1977, *Haegi* 1539 (BRI, NSW); 0.4 km W along Dennis Road, Ingalba S.F., 27 km NW of Kempsey, Dec 1998, *Lepschi* 4021 & *Connors* (CANB, NSW); Forbes Forest road, NW of Wauchope, Nov 1999, *Bean* 15702 (BRI, NSW); Welsh's Road, Clouds Creek S.F., N of Dorrigo, Sep 2000, *Bean* 16854 (BRI, NSW); Blacksmiths Shop road, Dalmorton S.F., SW of Grafton, Jan 2001, *Bean* 17252 (BRI). SOUTH COAST: Long Beach, Batemans Bay, Apr 1990, *Hancock* (AD, CANB, NSW); Blairs Road, Square Head, Batemans Bay, Jan 1995, *Rees* 300 (CANB); Eurobodalla Regional Botanic Gardens, Dec 1999, *Booth* 2511 (AD, BRI, NSW). **Cultivated:** Waite Institute ex Little Smoky, N.S.W., Dec 1967, *Symon* 4701 (AD, BRI, NSW).

***Distribution and habitat*:** *Solanum hapalum* extends from the extreme south-east of Queensland (Mt Barney, Mt Ballow, Mt Lindesay) to around Port Macquarie in New South Wales (**Map 1**), and with a disjunct occurrence near Batemans Bay. It grows on rainforest margins or in “wet sclerophyll” eucalypt forest, preferring disturbed areas such as roadsides or recently logged sites.

***Phenology*:** Flowers and fruits are recorded for most months of the year.

***Notes*:** *S. hapalum* is related to *S. densevestitum*, but differing by the smaller stellate hairs on all plant parts, the stellate hairs sessile on the lower leaf surface (stalks up to 0.5 mm long for *S. densevestitum*), the branchlet stellate hairs sessile or almost so, and with 7 or 8 lateral rays (stalks conspicuous, to 2 mm long, and with 4–6 lateral rays for *S. densevestitum*) and the ovary with Type 2 hairs only (Type 2 hairs and stellate hairs for *S. densevestitum*).

***Conservation status*:** Widespread. Not considered at risk.

***Etymology*:** from the Latin *hapalus*, meaning ‘soft to the touch’, in reference to the soft, felty leaves and stems.

4. Solanum johnsonianum A.R.Bean **sp. nov.** Subfrutex usque ad 0.25 m altus, aculeis carens; folia integra late ovata, indumento coacto; stellae sessiles, radio centrali longo, in pagina superiore folii 0.25–0.35 mm diametro; fructus globulares, 5.5–8 mm diametro, succosi et laete rubri maturitate; lobi calycis elliptici, fructus superantes. **Typus:** Queensland. LEICHHARDT DISTRICT: “Nirvana”, *c.* 15 km WNW of Banana, 18 April 2003, *A.R. Bean* 20165 (holo: BRI (1 sheet + spirit); iso: CANB, MEL, NSW, *distribuendi*).

Erect, rhizomatous perennial shrub, 0.15–0.3 m high. Juvenile branchlets without prickles; leaves (in outline) broadly ovate, shallowly-lobed, with 2 pairs of lobes; lamina 4.5–5.5 cm long, 3.3–3.8 cm wide, without prickles on upper surface. Adult stem prickles absent. Adult branchlets grey to rusty or brown; prickles absent; stellae very dense, 0.4–0.5 mm diameter, sessile; lateral rays 7–9, porrect; central ray 3–5 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Adult leaves* broadly ovate, entire; lamina 2.5–6 cm long, 1.3–4.3 cm wide, 1.4–2 times longer than broad, apex obtuse, base obtuse or cordate, oblique part 0–1 mm long, obliqueness index 0–3 percent; petioles 0.9–2.8 cm long, 30–55% length of lamina, prickles absent. *Upper leaf surface* green; prickles absent; stellate hairs distributed throughout; protostellae present; ordinary stellae dense, 0.15–0.25 mm apart, 0.25–0.35 mm across,

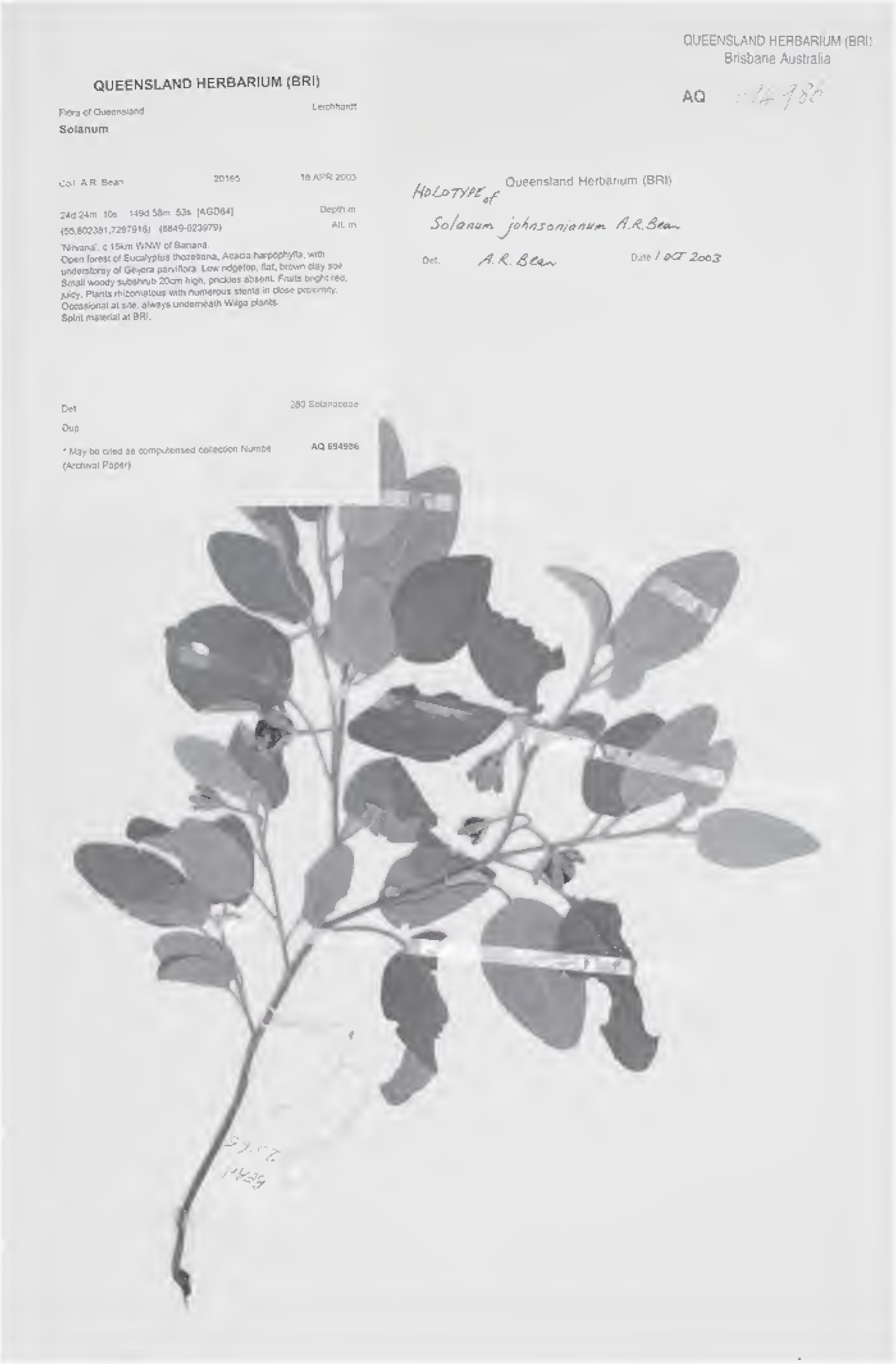

QUEENSLAND HERBARIUM (BRI)
Brisbane Australia
AQ 714980
QUEENSLAND HERBARIUM (BRI)
Flora of Queensland
Leichhardt
Solanum
Col. A.R. Bean
20165
18 APR 2003
24d 24m 10s 149d 58m 53s [AGD84]
Depth m
Alt. m
(55,802381,7297916) (8849-023979)
'Nirvana', c 15km WNW of Banana.
Open forest of Eucalyptus thozetiana, Acacia harpophylla, with understorey of Geijera parviflora. Low ridgetop, flat, brown clay soil.
Small woody subshrub 20cm high, prickles absent. Fruits bright red, juicy. Plants rhizomatous with numerous stems in close proximity.
Occasional at site, always underneath Wilga plants.
Spirit material at BRI.
Det
283 Solanaceae
Dup
* May be cited as computerised collection Number
AQ 694986
(Archival Paper)
HOLOTYPE of
Queensland Herbarium (BRI)
Solanum johnsonianum A.R.Bean
Det. A.R. Bean
Date 1 OCT 2003

Fig. 14. Holotype of *Solanum johnsonianum*.

sessile; lateral rays 7–9, porrect; central ray 3–5 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Lower leaf surface* greenish-white or white; prickles absent; stellae dense to very dense, 0.1–0.2 mm apart, 0.3–0.6 mm diameter, sessile; lateral rays 7 or 8, porrect; central ray 2–5 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Inflorescence* supra-axillary, solitary or pseudo-racemose, common peduncle 0–2 mm long, rachis prickles absent; 1 or 2-flowered, with all flowers bisexual and 5-merous; pedicels 4–7 mm long at anthesis, same thickness throughout, *c.* 0.7 mm thick at mid-point, prickles absent. Calyx tube 1–3 mm long, lobes elliptic, 4–6.5 mm long; prickles absent at anthesis; stellae very dense, yellow, 0.3–0.4 mm across, sessile, lateral rays 7 or 8, central ray 3–5 times as long as laterals, not gland-tipped or gland-tipped; finger hairs absent; Type 2 hairs absent. Corolla mauve, 6–11 mm long, rotate or shallowly lobed, inner surface glabrous; anthers 3–4 mm long; ovary glabrous, or with Type 2 hairs only; functional style 5–6.5 mm long, erect, glabrous or with Type 2 hairs only. *Fruiting calyx* with lobes exceeding mature fruit, prickles absent. Mature fruits 1 or 2 per inflorescence, globular, 5.5–8 mm diameter, red, 1-locular (septum absent or incomplete); placenta not apparent; mesocarp juicy, succulent; exocarp 0.3–0.5 mm thick; pedicels 10–16 mm long in fruit, 0.8–0.9 mm thick at mid-point; seeds pale yellow, 2.2–2.8 mm long. **Fig. 14.**

Specimens examined**: Queensland.** LEICHHARDT DISTRICT: ‘Cottenham’, *c.* 10 miles [16 km] NW of Banana, May 1960, *Johnson* 1708, 1709 (BRI); ‘The Rhyddings’, *c.* 38 km SW of Moura, Aug 1962, *Johnson* 2473 (BRI); site of Brigalow Research Station, 20 miles [32 km] NW of Theodore, Apr 1963, *Johnson* 2621 (BRI, CANB); *c.* 4 miles [6 km] E of Moura, Mar 1967, *Henderson* 223 (BRI). PORT CURTIS DISTRICT: Orange Creek, *c.* 20 miles [32 km] NW of Biloela, Jun 1959, *Johnson* 854 (BRI); 1.6 km along Hibbs Road, N of Jambin, Apr 2003, *Bean* 20225 (BRI).

Distribution and habitat**:** *Solanum johnsonianum* is endemic to Queensland. It extends from north-west of Theodore to north of Biloela (**Map 3**), a distance of around 100 kilometres. All specimens were found in communities dominated or co-dominated by *Acacia harpophylla* (Brigalow), on heavy cracking clay soils. In some cases, the specimen labels say “recently burnt” or “recently cleared Brigalow scrub”.

Phenology**:** Flowers recorded for March, May, June and August; mature fruits recorded for April and May.

Notes**:** *S. johnsonianum* is distinguished from *S. nemophilum* by the branchlet stellae with a central ray 3–5 times longer than the lateral rays (0.7–1.2 times for *S. nemophilum*), central ray similarly much longer on other plant parts, stellae 0.25–0.35 mm diameter on upper leaf surface (0.4–0.7 mm for *S. nemophilum*), upper leaf surface lacking Type 2 hairs and stellae without stalks (Type 2 hairs present, stellae stalks 0.1–0.3 mm long for *S. nemophilum*). *S. johnsonianum* is also closely related to *S. innoxium*. It differs from the latter by the broader leaves (1.4–2 times longer than wide), the longer petioles (9–28 mm long), the greater petiole/lamina ratio (30–55%), the larger stellae on the lower leaf surface (0.3–0.6 mm diameter) and the calyx stellae with the central ray often gland-tipped.

Conservation status**:** *Solanum johnsonianum* can no longer be found at most of the localities cited above. It is currently known from 3 locations, including the Brigalow Research Station, where the species is under threat from abnormally intensive grazing by wallabies. The other two populations are threatened by weeds (pasture grasses) and land clearance. No population is protected within a conservation reserve. Applying the IUCN guidelines (IUCN. 2001), a category of “Endangered” is recommended (EN A3c; B1ab(iii,v)+2ab(iii,iv,v); C1).

Etymology**:** Named for Robert W. Johnson, former Director of the Queensland Herbarium, and an assiduous collector of solanums, including almost all the specimens of this species.

5. Solanum innoxium A.R.Bean **sp. nov.** Frutex usque ad 0.6 m altus, aculeis carens; folia integra, lanceolata, indumento coacto; stellae sessiles, radio centrali radiis lateralibus 3–5plo longiore, in pagina superiore folii 0.2–0.25 mm diametro; fructus ellipsoidales, 3–4.5 mm diametro, succosi et laete rubri maturitate; calycis lobi elliptici, fructus superantes. **Typus:** Queensland. MARANOA DISTRICT: slopes of

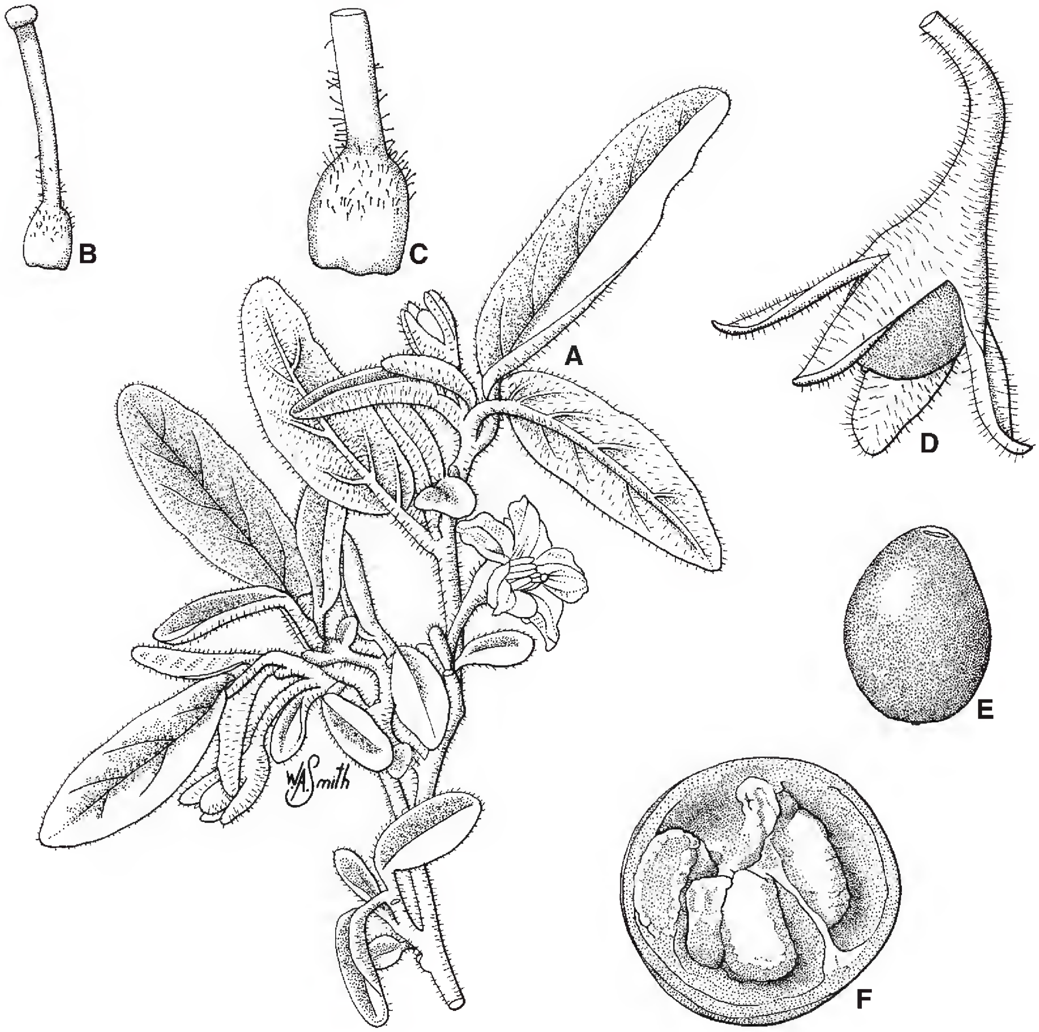


Fig. 15. ***Solanum innoxium***. A. flowering branchlet × 1.5. B. style and ovary × 6. D. ovary showing Type 2 hairs × 12. D. mature fruit still attached × 4. E. mature fruit, detached × 5. F. transverse section of fruit × 8. A, *Pedley* 792; B–C, *Bean* 17775; D–F, *Bean* 18367.

> Thomby Range, 'Glen Fosslyn', SE of Surat, 31 August 2001, *A.R. Bean* 17775 (holo: BRI (1 sheet + spirit); iso: MEL, NSW).

Erect, rhizomatous perennial shrub, 0.3–0.6 m high. Leaves (in outline) lanceolate, entire; without prickles on upper surface. Adult stem prickles absent. Adult branchlets yellow or brown; prickles absent; stellae very dense, 0.25–0.4 mm diameter, sessile; lateral rays 7 or 8, porrect; central ray 3–4 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Adult leaves* lanceolate or ovate, entire; lamina 2.5–7 cm long, 0.8–2 cm wide, 2.6–4.2 times longer than broad, apex obtuse or acute, base obtuse or cordate, oblique part 0–2 mm long, obliqueness index 0–5 percent; petioles 0.4–0.8 cm long, 11–19% length of lamina, prickles absent. *Upper leaf surface* grey-green; prickles absent; stellate hairs distributed throughout; protostellae absent; ordinary stellae density moderate to dense, 0.1–0.15 mm apart, 0.2–0.3 mm across, sessile; lateral rays 7 or 8, porrect; central ray 3–6 times as long as laterals, not gland-tipped;

finger hairs absent; Type 2 hairs absent. *Lower leaf surface* white or yellowish; prickles absent; stellae very dense, 0.05–0.1 mm apart, 0.25–0.4 mm diameter, stalks 0–0.1 mm long; lateral rays 7 or 8, porrect; central ray 3–5 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Inflorescence* supra-axillary, solitary or pseudo-umbellate, common peduncle absent; 1 or 2-flowered, with all flowers bisexual and 4 or 5-merous; pedicels 5–11 mm long at anthesis, same thickness throughout, 0.7–0.8 mm thick at mid-point, prickles absent. Calyx tube 1–1.5 mm long, lobes elliptic, 4–5.5 mm long; prickles absent at anthesis; stellae very dense, transparent, 0.25–0.4 mm across, sessile, lateral rays 7 or 8, central ray 2.5–5 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. Corolla mauve or purple, 7–9 mm long, deeply lobed, inner surface glabrous; anthers 3–4.5 mm long; ovary with Type 2 hairs only, or with stellate and Type 2 hairs; functional style 4–5 mm long, erect, glabrous or with stellate and Type 2 hairs, stellae 0.2–0.25 mm across, lateral rays 7 or 8, central ray *c.* 1 times as long as laterals. *Fruiting calyx* with lobes exceeding mature fruit, prickles absent. Mature fruits 1 per inflorescence, ellipsoidal, 3–4.5 mm diameter, red, with a few scattered Type 2 hairs, 1-locular (septum absent or incomplete); placenta not apparent; mesocarp juicy, succulent; exocarp 0.2–0.3 mm thick; pedicels 7–11 mm long in fruit, 0.7–0.8 mm thick at mid-point; seeds pale yellow, 2.2–2.3 mm long. **Fig. 15.**

***Specimens examined*: Queensland.** MARANOA DISTRICT: E of Combididan Farm, 'Cypress Downs' [NE of Yuleba], Sep 1961, *Jones* 166 (BRI); 'Boxleigh', S of Surat, Aug 2001, *Bean* 17762 (BRI, MEL, NSW); Thomby Range, SW of Glenmorgan, Jan 2002, *Bean* 18367 (BRI); 'Silver Springs', S of Surat, Jan 2002, *Bean* 18374 (BRI). DARLING DOWNS DISTRICT: 'Calala', *c.* 10 miles [16 km] E of Meandarra, Jun 1960, *Johnson* 1620A (BRI); 'Woodlands', 5 miles [8 km] SW of Westmar, Jul 1961, *Pedley* 792 (BRI, CANB); Hannaford, 42 km W of Tara, Apr 1963, *T.J. McDonald* 63 (BRI, CANB).

***Distribution and habitat*:** *Solanum innoxium* is endemic to Queensland, where it extends from near Yuleba to Westmar (**Map 3**). Habitat varies from ridges dominated by Lancewood (*Acacia shirleyi*) or Bendee (*Acacia catenulata*), to *Eucalyptus populnea* woodland, and one record from an *Acacia harpophylla* community. Soils also vary from shallow stony loams, to red-brown clay loams, or heavy grey clays.

***Phenology*:** Flowers are recorded for January, and from June to September; mature fruits recorded for January and April.

***Notes*:** *S. innoxium* is allied to *S. nemophilum* but differs by the lanceolate leaves, the stellae of the upper leaf surface 0.2–0.3 mm diameter (0.4–0.7 mm for *S. nemophilum*), the branchlet stellae with the central ray 3–4 times longer than the lateral rays (0.7–1.2 times for *S. nemophilum*), the stellae on the lower leaf surface sessile or with stalks to 0.1 mm long (stalks 0.2–0.4 mm for *S. nemophilum*), style 4–5 mm long (5.5–8 mm long for *S. nemophilum*) and the ellipsoidal fruits (globular for *S. nemophilum*). *S. innoxium* differs from *S. hapalum* by the shorter and narrower leaves, shorter petioles, smaller stellae on the lower leaf surface, shorter style, the relatively long Type 2 hairs on the ovary, and the ellipsoidal fruits.

***Conservation status*:** *Solanum innoxium* is currently known from 3 locations. It does not occur in a conservation reserve. It is threatened by land clearance and weeds. Applying the IUCN guidelines (IUCN. 2001), a category of "Vulnerable" is recommended (VU A3ce; C1).

***Etymology*:** From the Latin *innoxius*, meaning 'harmless'. This is in reference to the lack of prickles on plants of this species.

6. Solanum ultimum A.R.Bean **sp. nov.** Frutex usque ad 0.6 m altus, aculeis carens; folia integra, ovata; stellae sessiles, radio centrali radiis lateralibus 0.4–1plo longiore, in pagina inferiore folii 0.4–0.6 mm diametro, in pagina superiore folii indumento absente usque ad moderate denso; fructus globulares, 6–9 mm diametro, succosi et laete rubri maturitate; calycis lobi elliptici, fructus superantes. **Typus:** Queensland. BURKE DISTRICT: 3 km by road south then west of 'Warang' homestead site, White Mountains National Park, 11 April 2000, *M.B. Thomas* 1572 & *E.J. Thompson* (holo: BRI; iso: DNA, NSW).

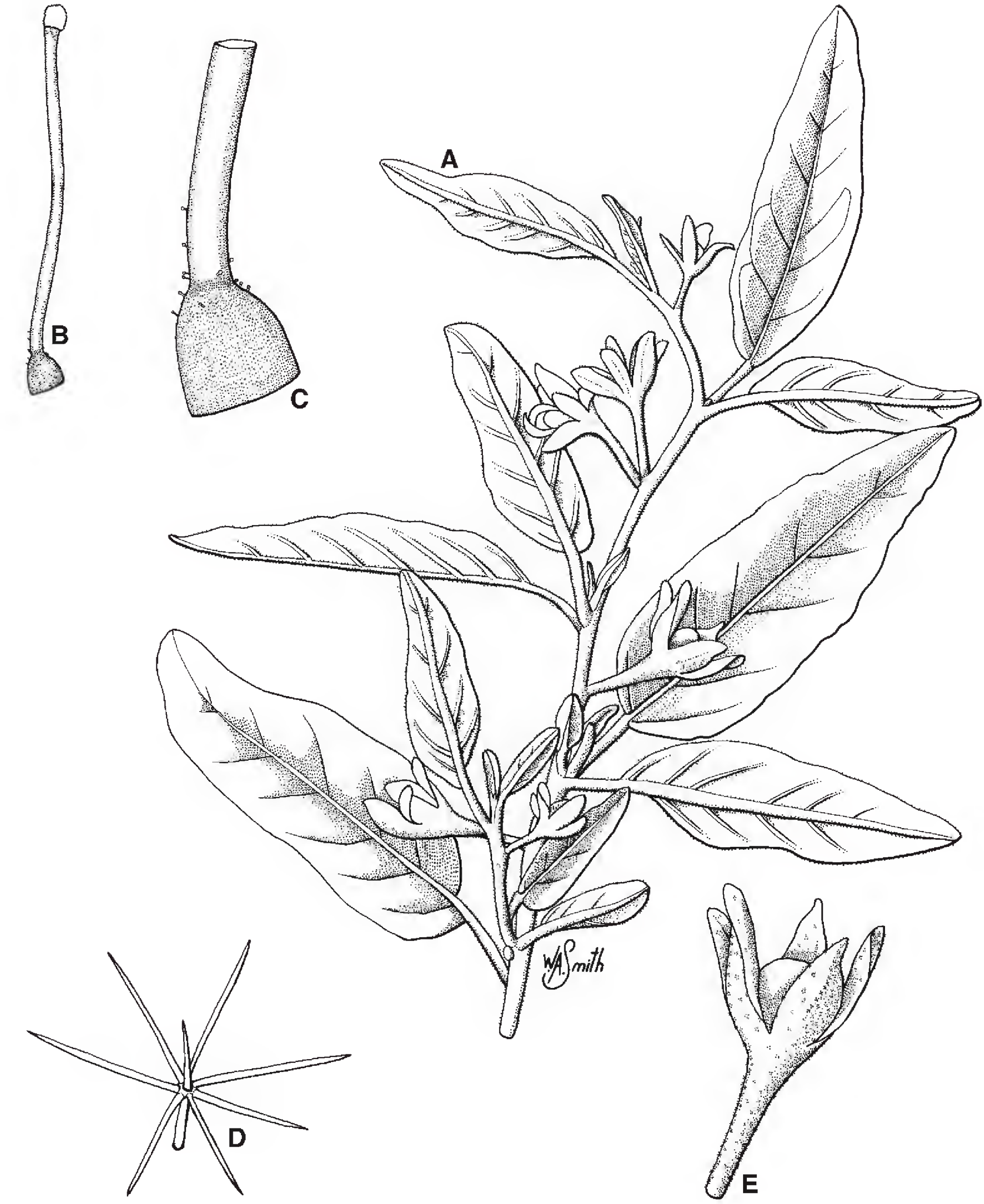


Fig. 16. ***Solanum ultimum***. A. flowering branchlet × 1. B. style and ovary × 6. C. ovary showing Type 2 hairs × 20. D. stellate hair from upper leaf surface × 60. E. mature fruit × 2. all from *Cottam* AZI 1520.

Solanum nemophilum var. *brachycarpum* Domin, Biblioth. Bot. 89: 585 (1929). **Type:** Queensland. North Kennedy District: near Pentland, March 1910, *K. Domin* (holo: PR).

Erect, rhizomatous perennial shrub, 0.3–0.6 m high. Juvenile stage unknown. Adult stem prickles absent. Adult branchlets white, grey or yellow; prickles absent; stellae very dense, 0.6–0.9 mm diameter, stalks 0–0.1 mm long; lateral rays 7–9, porrect; central ray 0.4–0.8 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Adult leaves* lanceolate or ovate, entire; lamina 4–6 cm long, 1.1–2.3 cm wide, 2.7–3.6 times longer than broad, apex obtuse or acute, base cuneate or obtuse, oblique part 0–1.5 mm long, obliqueness index 0–2 percent; petioles 0.7–1.4 cm long, 16–23% length of lamina, prickles absent. *Upper leaf surface* green; prickles absent; stellate hairs confined to midrib, or distributed throughout; protostellae present; ordinary stellae very sparse to sparse, 0.4–4 mm apart, 0.25–0.4 mm across, sessile; lateral rays 7 or 8, porrect; central ray 0.5–1 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Lower leaf surface* white; prickles absent; stellae dense to very dense, 0.1–0.2 mm apart, 0.4–0.6 mm diameter, stalks 0–0.1 mm long; lateral rays 8–9, porrect; central ray 0.2–0.8 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Inflorescence* supra-axillary, solitary or pseudo-umbellate, common peduncle absent; 1–3-flowered, with all flowers bisexual and 4 or 5-merous; pedicels 5–9 mm long at anthesis, same thickness throughout or markedly thicker distally, 0.9–1 mm thick at mid-point, prickles absent. Calyx tube 0.5–1.5 mm long, lobes elliptic, 4–6 mm long; prickles absent at anthesis; stellae dense to very dense, white, 0.4–0.5 mm across, stalks 0–0.1 mm long, lateral rays 8–9, central ray 0.4–0.8 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. Corolla purple, 7–9 mm long, shallowly lobed, inner surface glabrous; anthers 3.5–4.5 mm long; ovary with Type 2 hairs only; functional style 5.5–7 mm long, erect, glabrous or with Type 2 hairs only. *Fruiting calyx* with lobes exceeding mature fruit, prickles absent. Mature fruits 1 or 2 per inflorescence, globular, 6–9 mm diameter, red; mesocarp juicy, succulent; pedicels 7–12 mm long in fruit, 1.5–1.9 mm thick at mid-point; seeds pale yellow, 2.4–2.7 mm long. **Fig. 16.**

***Specimens examined*:** **Queensland.** Burke District: White Mountains N.P., near 'Warang', Mar 2000, *Wannan* 1624 (BRI, NSW); 0.5 km W of 'Warang' HS site, White Mountains N.P., Apr 2000, *Thomas* 1803 & *Thompson* (BRI). Mitchell District: 'Narbethong' SE of Barcaldine, Jun 1997, *Cottam* AZI1517 (BRI); 'Narbethong', SE of Barcaldine, Dec 1997, *Milson* AZI1537 (BRI).

***Distribution and habitat*:** *Solanum ultimum* is endemic to Queensland. It is known from the White Mountains National Park and from near Barcaldine (**Map 3**). It grows on red sandy soil with *Corymbia* sp., *Eucalyptus persistens* or *Melaleuca tamariscina*.

***Phenology*:** Flowers are recorded for April, June and December; mature fruits in April and December.

***Notes*:** *S. ultimum* differs from *S. nemophilum* by the indumentum of the upper leaf surface absent to sparse (indumentum moderately dense to dense for *S. nemophilum*), upper leaf surface with stellate hairs sessile and Type 2 hairs absent (stellate hairs with stalks 0.1–0.3 mm long and Type 2 hairs present for *S. nemophilum*), calyx stellate hairs with a central ray 0.4–0.8 times length of lateral rays (0.8–1.2 times for *S. nemophilum*), and the larger seeds.

S. ultimum differs from all other species in the *S. densevestitum* group by the upper leaf surface with the stellate indumentum absent or at most moderately dense, and by the stellae with a comparatively short central ray on all plant parts.

***Conservation status*:** Data deficient.

***Etymology*:** From the Latin *ultimus*, meaning 'most distant'. This refers to the geographical remoteness from the eastern Australian coast, where its relatives are located.

7. Solanum densevestitum F. Muell. ex Benth., Fl. Austral. 4: 456 (1868). **Type:** Queensland. 'Brisbane River', December 1856, *F. Mueller* (lecto: MEL [MEL12200]), *fide* Symon (1981).

Erect, rhizomatous perennial shrub, 0.4–0.9 m high. Juvenile branchlets without prickles; leaves (in outline) broadly ovate, shallowly-lobed, with 2–3 pairs of lobes; lamina *c.* 9 × 6 cm, without prickles on upper surface. Adult stem prickles absent. Adult branchlets grey; prickles absent; stellae dense to very dense, 0.7–1.5 mm diameter, stalks 0–2 mm long; lateral rays 4–6, porrect; central ray 1.5–4 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Adult leaves* ovate or broadly ovate, entire; lamina 5–10 cm long, 2.6–5.5 cm wide, 1.6–2 times longer than broad, apex acute, base obtuse or cordate, oblique part 0–5 mm long, obliqueness index 0–5 percent; petioles 0.9–3.4 cm long, 17–35% length of lamina, prickles absent. *Upper leaf surface* green; prickles absent; stellate hairs distributed throughout; protostellae present; ordinary stellae dense, 0.2–0.4 mm apart, 0.5–1.1 mm across, sessile; lateral rays 4–6, porrect; central ray 3–6 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Lower leaf surface* green; prickles absent; stellae dense, 0.1–0.3 mm apart, 0.7–1.6 mm diameter, stalks 0–0.5 mm long; lateral rays 4–8, porrect; central ray 2–5 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Inflorescence* supra-axillary, solitary or pseudo-umbellate, common peduncle 0–4 mm long; 1–3-flowered, with all flowers bisexual and 5-merous; pedicels 4–9 mm long at anthesis, same thickness throughout, 0.5–0.6 mm thick at mid-point, prickles absent. Calyx tube 1.5–2.5 mm long, lobes elliptic, 6–10 mm long; prickles absent at anthesis; stellae dense, transparent, 0.8–1.8 mm across, stalks 0–0.9 mm long, lateral rays 4 or 5, central ray 1.5–3 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. Corolla purple, 10–13 mm long, shallowly lobed, inner surface glabrous; anthers 4–5.5 mm long; ovary with stellate and Type 2 hairs; functional style 6–7.5 mm long, erect, with Type 2 hairs only. *Fruiting calyx* with lobes exceeding mature fruit, prickles absent. Mature fruits 1 or 2 per inflorescence, globular, *c.* 7 mm diameter, red, 1-locular (septum absent or incomplete); placenta not apparent; mesocarp juicy, succulent; pedicels 9–12 mm long in fruit; seeds pale yellow, 2–2.2 mm long. *Felty Nightshade.*

***Selected specimens*:** **Queensland.** SOUTH KENNEDY DISTRICT: S of Massey Creek, Eungella N.P., Sep 1991, *Bean* 3682 (BRI); Eungella Range, Schumanns Road, *c.* 1.1 km E of Swampy Ridge, Jun 1995, *Pollock* 233 (BRI). BURNETT DISTRICT: 14 km ESE of Elgin Vale, Jan 1991, *Pedley* 5596 (BRI). WIDE BAY DISTRICT: Lagoon Pocket via Gympie, Aug 1930, *Lowe s.n.* (BRI); Elanda Point, near Lake Cootharaba, Jun 1986, *Sandercoe* C996 & Milne (BRI); S.F.639 Wrattens, Apr 1996, *Forster* 19136 & *Leiper* (AD, BRI); Booloumba Creek road, SW of Kenilworth, Aug 1999, *Bean* 15246 (BRI, NSW); S.F.256 Imbil, Mitchell L.A., Mar 2003, *Forster* PIF29294 *et al.* (BRI, MEL, NE, NSW). MORETON DISTRICT: Enoggera, Mar 1912, *White s.n.* (BRI); Blackall Range, Dec 1918, *White s.n.* (BRI); near Samford, on House Mtn, Feb 1945, *Blake* 15506 (BRI); Bruce Hwy, Caboolture, Jun 1960, *Williamson s.n.* (BRI); Benarkin S.F. near Blackbutt, Jul 1974, *Moriarty* 1542 (BRI, CANB); Maiala Reserve, near Mt Glorious, Jun 1989, *Symon* 14881 (AD, BRI); Mt Perserverance S.F.757, Jul 1996, *Stephens* ESK28 & *Dowling* (BRI).

***Distribution and habitat*:** *Solanum densevestitum* is endemic to Queensland. From the north-western outskirts of Brisbane to Gympie and west to Gallangowan, plus a remarkable outlier at Eungella, west of Mackay (**Map 2**). It inhabits dense eucalypt forest with a shrubby understorey of rainforest species, often in areas that have been disturbed *e.g.* by roadworks.

***Phenology*:** Flowers are recorded for all months of the year; mature fruits are recorded between April and August.

***Notes*:** *Solanum densevestitum* differs from all other related species by the stellae on upper leaf surface being sessile, with only 4 or 5 (rarely 6) lateral rays; the long-stalked stellae of the branchlets (stalks up to 2.0 mm long); and the leaf lower surface green.

The collections cited by Bentham in the protologue belong to three species; *S. densevestitum* (as to lectotype), the recently named *S. stupefactum* Symon, and *S. hapalum* (described in this paper). The description given in the protologue was clearly derived from a combination of these taxa.

The isolectotype cited by Symon (1981) is a mixed specimen. There are three specimens on the sheet; the lowermost piece is *S. densevestitum*, as to lectotype; the upper two pieces are *S. stupefactum* Symon.

The locality of “Tweed River district” given for a collection by E. Betche in April 1896 (held at NSW) must be regarded with considerable suspicion, as there have been no subsequent collections from there or anywhere nearby.

Typical specimens of *S. densevestitum* and *S. nemophilum* are readily distinguished by the stellae of the upper leaf surface (stalk length and lateral ray number). However, collections from the Benarkin – Yarraman area appear to be morphologically intermediate and difficult to assign to either species.

Juvenile leaves of *S. densevestitum* are frequently lobed, in a similar fashion to adult leaves of *S. gympiense*.

Conservation status: Moderately widespread. Not considered at risk.

8. Solanum nemophilum F.Muell., Fragm. 2: 161 (1861); *S. nemophilum* var. *nemophilum* Domin, Biblioth. Bot. 89: 584 (1929); *S. nemophilum* var. *typicum* Domin, Biblioth. Bot. 89: 584 (1929), *nom. inval.* **Type:** [Queensland. LEICHHARDT DISTRICT:] 'between Mackenzie and Dawson Rivers', November 1856, *F. Mueller* (lecto: MEL; isolecto: K, photo seen).

Erect, rhizomatous perennial shrub, 0.3–0.6 m high. Juvenile branchlets with 0–5 prickles per dm, 2–3 mm long; leaves (in outline) ovate, entire; lamina *c.* 4 × 2 cm, with 0–4 prickles on upper surface. Adult stem prickles absent. Adult branchlets white or grey; prickles absent; stellae very dense, 0.3–1 mm diameter, stalks 0–0.6 mm long; lateral rays 7 or 8, porrect; central ray 0.7–1.2 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Adult leaves* ovate, entire; lamina 2.5–7 cm long, 1.2–2.8 cm wide, 1.8–3 times longer than broad, apex obtuse or acute, base obtuse or cordate, oblique part 0–3 mm long, obliqueness index 0–5 percent; petioles 0.4–1.4 cm long, 15–35% length of lamina, prickles absent. *Upper leaf surface* grey-green; prickles absent; stellate hairs distributed throughout; protostellae absent; ordinary stellae dense, 0.1–0.3 mm apart, 0.4–0.7 mm across, stalks 0.1–0.3 mm long; lateral rays 7 or 8, porrect; central ray 0.7–1.8 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Lower leaf surface* green or yellowish; prickles absent; stellae dense to very dense, 0.05–0.15 mm apart, 0.5–0.7 mm diameter, stalks 0.2–0.4 mm long; lateral rays 7 or 8, porrect; central ray 0.5–1.2 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Inflorescence* supra-axillary, pseudo-umbellate, common peduncle 0–3 mm long; 3–5-flowered, with all flowers bisexual and 4 or 5-merous; pedicels 4–7 mm long at anthesis, same thickness throughout, 0.9–1 mm thick at mid-point, prickles absent. Calyx tube 1–2 mm long, lobes elliptic, 2.5–7 mm long; prickles absent at anthesis; stellae very dense, white, 0.4–1 mm across, stalks 0–0.25 mm long, lateral rays 7 or 8, central ray 0.8–1.2 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. Corolla purple, 7–10 mm long, rotate or shallowly lobed, inner surface glabrous; anthers 3–4 mm long; ovary with Type 2 hairs only; functional style 5.5–8 mm long, erect, with Type 2 hairs only. *Fruiting calyx* with lobes exceeding mature fruit, prickles absent. Mature fruits 1 per inflorescence, globular, 4.5–9 mm diameter, red, glabrous or with a few scattered Type 2 hairs, 1-locular (septum absent or incomplete); placenta not apparent; mesocarp juicy, succulent; exocarp 0.2–0.25 mm thick; pedicels 6–11 mm long in fruit, 0.8–1.2 mm thick at mid-point; seeds pale yellow, 2–2.3 mm long.

***Selected specimens examined*: Queensland.** LEICHHARDT DISTRICT: Duaringa, Mar 1909, *Maiden* (NSW); Blackdown Tableland, *c.* 35 km SE of Blackwater, Sep 1971, *Henderson* H1094 *et al.* (BRI, CANB); top of Carnarvon Range, N of Injune, Sep 2003, *Bean* 20760 (BRI). PORT CURTIS DISTRICT: S.F.69 Dawes Range, SE of Biloela, Dec 1999, *Bean* 15933 (BRI). BURNETT DISTRICT: *c.* 14 km NNE of Eidsvold, Oct 1993, *Lepschi & Slee* 1215 (AD, BRI, CANB); *c.* 9.2 km NE of Durong on slopes above Hardy Creek, Jul 1998, *Pollock* ABP715 & *Dean* (BRI); Schellbachs road, Kingaroy, Mar 1999, *Haskard* 17 (AD, BRI); Hurdle Gully road, Coominglah S.F., W of Monto, Jan 2000, *Bean* 15934 (BRI). DARLING DOWNS DISTRICT: 6 miles [10 km] S of Warwick on Stanthorpe road, Nov 1946, *Everist & Webb* 1258 (BRI); 25 miles [40 km] WNW of Dalby on road to Kogan, Oct 1969, *Everist s.n.* (BRI); Amiens, 10 miles [16 km] NW of Stanthorpe, Jul 1974, *Swan* 71 (BRI); Centenary road, W of Goombungee, May 1997, *Bean* 12000 (BRI); S.F.197 Diamondy, 32 km NE of Jandowae, Mar 1999, *Forster* PIF24090 & *Booth* (AD, BRI, MEL); Bony Mountain, 14 km SW of Allora, Aug 1999, *Bean* 15259 (BRI); Wondul Range N.P., SW of Milmerran, Nov 1999, *Bean* 15888 (BRI). MORETON DISTRICT: Tarampa, undated, *Bailey* (BRI); Falls Creek, 4.5 km NW of West Haldon, May 1987, *Forster* 2940 & *Bird* (BRI); Scanlon scrub, Mount Berryman, 15 km SW of Laidley, Aug 1990, *Bird* (BRI); near High Camp, 11 km SE of Cooyar, Feb 2000, *Bean* 16048 (BRI).

***Distribution and habitat*:** *Solanum nemophilum* is endemic to Queensland. Widespread in subcoastal areas of Queensland from Duaringa to Boonah and Warwick, and west to Kogan and Miles (**Map 4**). It grows in shrubby eucalypt woodland in loamy soils.

***Phenology*:** Flowers and fruits may be borne at any time of the year.

***Notes*:** *S. nemophilum* is distinguished from other species of this group by the relatively long-stalked stellae on both leaf surfaces, and the stellae with a central ray more or less equal in length to the lateral rays.

A Scortechini specimen of *S. nemophilum* at BRI, reputedly from Roma, should be disregarded, as there have been no collections of this species from the Maranoa district over the last century.

***Conservation status*:** Widespread. Not considered at risk.

9. Solanum gympiense Symon, Austrobaileya 4: 433 (1995). **Type:** Queensland. WIDE BAY DISTRICT: Gundiah, 21 June 1927, *C.T. White* 3527 (holo: BRI).

Solanum sp. 2 in Ross (1986)

***Illustration*:** Symon (1995: 434)

Erect, rhizomatous perennial shrub, 0.2–0.5 m high. Leaves (in outline) broadly ovate, shallowly-lobed, with 3 or 4 pairs of lobes; lamina *c.* 6 × 4 cm, without prickles on upper surface. Adult stem prickles absent. Adult branchlets yellow or brown or green; prickles absent; stellae dense to very dense, 0.5–1 mm diameter, stalks 0–0.8 mm long; lateral rays 6–8, porrect or ascending; central ray 1–2 times as long as laterals, gland-tipped; finger hairs absent; Type 2 hairs absent. *Adult leaves* ovate or broadly ovate, entire or shallowly lobed throughout; lobes 3–5 on each side, obtuse, lobing index 1–1.2; lamina 4–10 cm long, 2.2–5.5 cm wide, 1.4–1.9 times longer than broad, apex obtuse or acute, base obtuse or cordate, oblique part 0–3 mm long, obliqueness index 0–4 percent; petioles 0.8–2.3 cm long, 17–30% length of lamina, prickles absent. *Upper leaf surface* green or grey-green; prickles absent; stellate hairs distributed throughout; protostellae present; ordinary stellae dense, 0.2–0.3 mm apart, 0.5–0.9 mm across, stalks 0–0.15 mm long; lateral rays 5–10, porrect or ascending; central ray 2–4 times as long as laterals, gland-tipped; finger hairs absent; Type 2 hairs absent. *Lower leaf surface* white; prickles absent; stellae dense to very dense, 0.1–0.25 mm apart, 0.8–1.3 mm diameter, stalks 0.1–0.5 mm long; lateral rays 5–11, porrect or ascending; central ray 0.8–2 times as long as laterals, gland-tipped; finger hairs absent; Type 2 hairs absent. *Inflorescence* supra-axillary, pseudo-racemose, common peduncle 4–21 mm long, rachis prickles absent; 3–7-flowered, weakly andromonoecious or with all flowers bisexual and 4 or 5-merous; pedicels 7–12 mm long at anthesis, same thickness throughout, 0.7–1.2 mm thick at mid-point, prickles absent. Calyx tube 1.5–3 mm long, lobes elliptic, 2.5–9 mm long; prickles absent at anthesis; stellae very dense, transparent, 0.7–1 mm across, stalks 0–0.7 mm long, lateral rays 7 or 8, central ray 1–3 times as long as laterals, gland-tipped; finger hairs absent; Type 2 hairs absent. Corolla mauve or purple, 11–15 mm long, deeply lobed, inner surface glabrous; anthers 4.5–6 mm long; ovary glabrous; functional style 6–11 mm long, erect, glabrous or with Type 2 hairs only or with stellate and Type 2 hairs, stellae *c.* 0.5 mm across, lateral rays *c.* 7, central ray *c.* 1.5 times as long as laterals. *Fruiting calyx* with lobes exceeding mature fruit, prickles absent. Mature fruits 1–4 per inflorescence, ellipsoidal, 4.5–7 mm diameter, red, 1-locular (septum absent or incomplete); placenta not apparent; mesocarp juicy, succulent; exocarp 0.2–0.3 mm thick; pedicels 7–15 mm long in fruit, 1.2–1.6 mm thick at mid-point; seeds pale yellow, 2.7–2.9 mm long.

***Specimens examined*:** **Queensland.** LEICHHARDT DISTRICT: crest of Carnarvon Range, Mar 1960, *Johnson* 1451 (BRI). PORT CURTIS DISTRICT: Rosedale, Mar 1931, *Dovey* K5 (BRI). MARANOA DISTRICT: 'Claravale', May 1962, *Johnson* 2440 (BRI); The Tombs, Maranoa River, *c.* 110 km NW of Injune, Jun 1977, *Crisp* 3113 (AD, BRI, CANB); 1.5 km SW of 'Kilmorey' HS, May 1982, *Neldner & Thomas* 627, 633 (BRI). WIDE BAY DISTRICT: Woondum, Oct 1917, *Moore* (BRI); Gundiah, Jun 1927, *White* 3528 (BRI); *c.* 6 miles [10 km] NW of Tiaro, Apr 1959, *Ridley s.n.* (BRI); 8 km SSW of Howard, Jan 1987, *Forster* 2855 (AD, BRI); Clifton Range, S.F. 676, 11 km N of Brooweena, Apr 1992, *Forster* PIF9694 (BRI); Veteran S.F., N of Gympie, Oct 1993, *Bean* 6706 (BRI); S.F.832, Cordalba S.F., *c.* 19.5 km SE of Gin Gin, Nov 1995, *Sparshott* KMS660 (BRI); S.F.1294 Parish of Doongul, *c.* 27 km S of Childers, May 1996, *Sparshott* KMS837 & *Shewell* (AD, BRI); *c.* 3 km SE of Fairlies Knob, Seaview Range, May 2000, *Phillips* 391 (BRI); S.F.940, 10 km SW of Bauple, Mar 2002, *Bean* 18555 (A, BRI, CANB, K, MEL, MO, PRE).

***Distribution and habitat*:** *Solanum gympiense* is endemic to Queensland where it extends along the coast from Woondum (near Gympie) to Rosedale (west of Bundaberg), with disjunct occurrences in the Carnarvon Range north of Injune (**Map 5**). It grows in shrubby eucalypt forest in sandy to loamy soil.

***Phenology*:** Flowers and fruits have been recorded for almost every month of the year.

***Notes*:** *S. gympiense* is distingushed from other species in the group by the stellae with gland-tipped central rays on most plant parts, and the adult leaves usually lobed.

***Conservation status*:** Widespread. Not considered at risk.

Group 13 (**S. ferocissimum group**) of Whalen (1984)

Perennial shrubs (100%); calyx and pedicel prickles absent, calyx lobes not elliptic (100%); large stems with prickles (100%); prickles acicular (100%); upper leaf surface green; fruits globular, red, juicy, 1-locular (100%); fruiting calyx less than half length of mature fruit (97%); inflorescence not branched (97%); corolla inner surface glabrous (93%); fruit exocarp <1 mm thick (93%); adult leaves entire or shallowly lobed (88%); fruits <12 mm diameter (80%); branchlet prickles present (77%); Type 2 hairs absent from branchlets (77%); average petiole length 12% of lamina length.

17 species endemic to Australia; 17 species occurring in Queensland.

10. Solanum fervens A.R.Bean **sp. nov.** Fructus erectus, aculeos aciculares sparse distributos gerens; folia integra vel non profunde lobata, lanceolata, supra glabra, subtus dense stellato-tomentosa; stellae radio centrali radiis lateralibus 3–6plo longiore; ovarium stellato-pubescens; exocarpium fructuum maturorum *c.* 0.8 mm crassum. **Typus:** Queensland. COOK DISTRICT: eastern bank of Jardine River mouth, 1 September 1985, *J.R. Clarkson* 6219 (holo: BRI (1 sheet + spirit); iso: AD, MBA, QRS).

Solanum sp. (Bamaga V. Scarth-Johnson 1117) in Henderson (2002)

Erect, rhizomatous perennial shrub, 1–2 m high. Juvenile stage unknown. Adult branchlets yellow or brown; prickles 3–20 per decimetre, straight, acicular, 3–5 mm long, 13–16 times longer than wide; stellae dense to very dense, 0.3–0.4 mm diameter, sessile; lateral rays 7 or 8, porrect; central ray 2–6 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Adult leaves* lanceolate or ovate, entire or shallowly lobed throughout; lobes 3 or 4 on each side, obtuse, lobing index 1–1.2; lamina 7.5–14 cm long, 2–4.5 cm wide, 2.5–5.2 times longer than broad, apex acute, base cuneate, oblique part 0–4 mm long, obliqueness index 0–4 percent; petioles 0.4–0.8 cm long, 3–7% length of lamina, prickles absent. *Upper leaf surface* green; prickles absent; stellate hairs absent, or confined to midrib; ordinary stellae absent from surface; finger hairs absent; Type 2 hairs absent. *Lower leaf surface* yellowish or rusty; prickles absent; stellae dense, 0.1–0.2 mm apart, 0.4–0.5 mm diameter, sessile; lateral rays 7 or 8, porrect; central ray 3–7 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Inflorescence* supra-axillary, pseudo-racemose, common peduncle 0–3 mm long, rachis prickles absent; 7–20-flowered, with all flowers bisexual and 5-merous; pedicels 4–7 mm long at anthesis, same thickness throughout, 0.25–0.4 mm thick at mid-point, prickles absent. Calyx tube 1.5–2 mm long, lobes deltate, 0.5–1.2 mm long; prickles absent at anthesis; stellae dense to very dense, yellow or white, 0.2–0.3 mm across, sessile, lateral rays 5–7, central ray 2–3 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. Corolla mauve, 5–7 mm long, deeply lobed, inner surface glabrous; anthers 3–4.5 mm long; ovary with stellate hairs only; functional style 5–7 mm long, erect, with stellate hairs only, stellae 0.2–0.4 mm across, lateral rays 5–7, central ray 0.5–1 times as long as laterals. *Fruiting calyx* with lobes less than half length of mature fruit, prickles absent. Mature fruits 1–3 per inflorescence, globular, 9–12 mm diameter, red, 1-locular

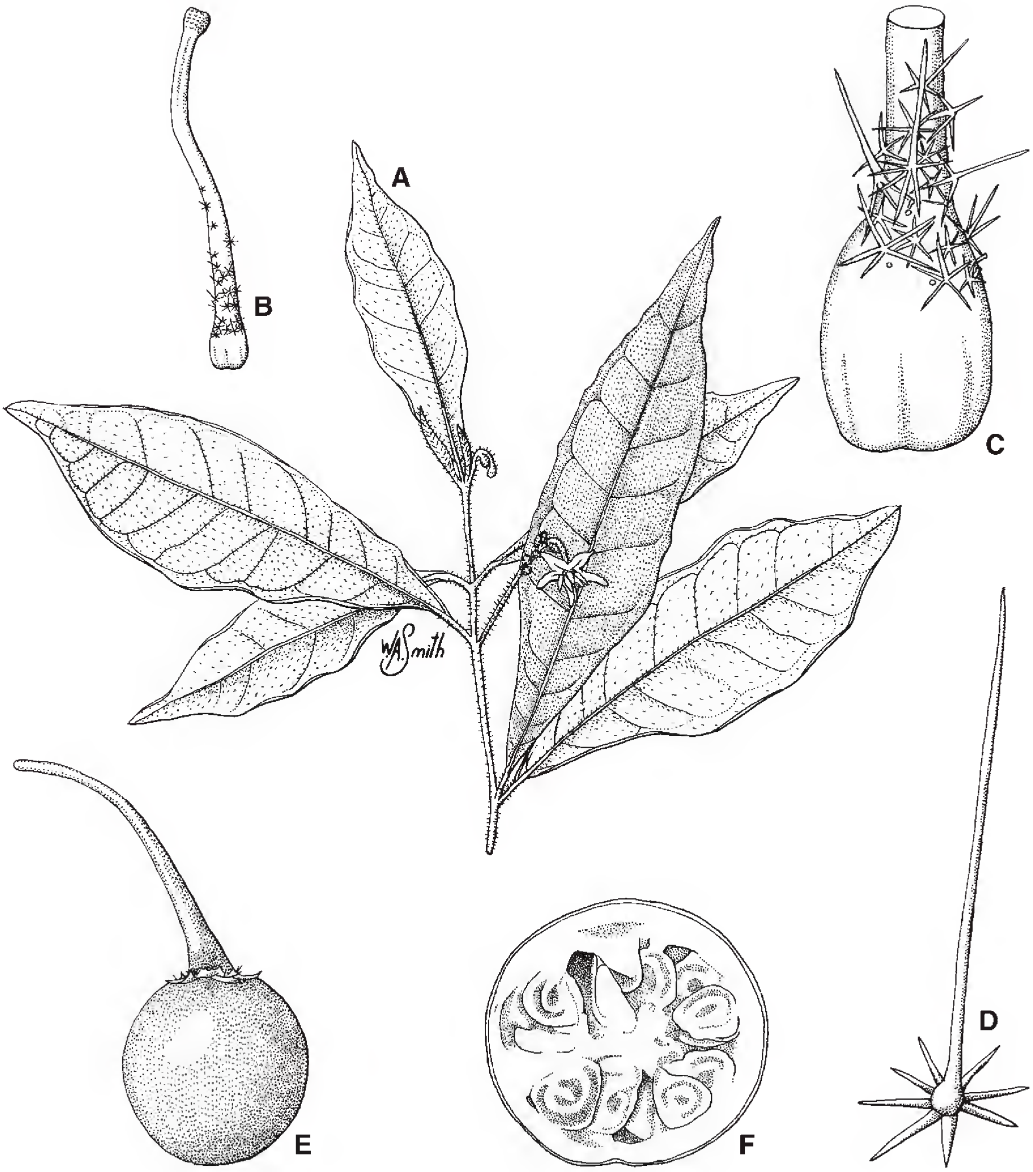


Fig. 17. *Solanum fervens*. A. flowering branchlet × 0.6. B. style and ovary × 6. C. ovary showing stellate hairs × 30. D. stellate hair from lower leaf surface × 60. E. mature fruit × 2. F. transverse section of fruit × 3. A–D, *Forster* 8968; E–F, *Clarkson* 6219.

(septum absent or incomplete); placenta not apparent; mesocarp juicy, succulent; exocarp *c.* 0.8 mm thick; pedicels 15–23 mm long in fruit, 0.5–0.8 mm thick at mid-point; seeds pale yellow, 3–3.5 mm long. **Fig. 17.**

***Specimens examined*: Queensland.** COOK DISTRICT: N of Olive River, Cape York Peninsula, Sep 1974, *Webb & Tracey* 13480 (BRI, QRS); tributary of Escape River, Jun 1978, *Clarkson* 2086 (BRI); Red Island Point, Bamaga, Sep 1980, *Scarth-Johnson* 1117A (BRI); 3 km NW of Bolt Head, Temple Bay, Jul 1991, *Forster* PIF8968 (AD, BRI, DNA, QRS); 15 km N of Middle Peak road junction, Mar 1992, *Johnson* 5114 (BRI); 0.4 km west of Sach Waterhole, *c.* 14 km NNW of Ussher Point, Jul 1992, *Clarkson* 9679 & *Neldner* (AD, BRI, MBA); Bolt Head, Jun 1996, *Gray* 6842, 6875 (BRI, QRS).

***Distribution and habitat*:** *Solanum fervens* is endemic to Queensland. Confined to the Cape York Peninsula, from the Bamaga area to Bolt Head and Temple Bay (**Map 2**). It grows on siliceous sand dunes in semi-deciduous vine-forest.

***Phenology*:** Flowers have been recorded in March, June and July; mature fruits in March, June and September.

***Notes*:** *S. fervens* is closely related to *S. discolor*, but differs by the dense indumentum on the leaf underside (very dense for *S. discolor*), the stellate hairs of the calyx and leaf underside having a much longer central ray, the longer hypanthium, the stellate pubescent ovary (glabrous for *S. discolor*), and the exocarp *c.* 0.8 mm thick (0.4–0.5 mm thick for *S. discolor*).

***Conservation status*:** Not considered at risk.

***Etymology*:** From the Latin *fervens*, meaning “burning, boiling, hot”. This is in reference to the high temperatures experienced by the species in the extreme north of Australia.

11. Solanum yirrkalense Symon, J. Adelaide Bot. Gard. 4: 137 (1981), as ‘yirrkalensis’. **Type:** Northern Territory. Yirrkala Gardens, 27 February 1976, *D. Hinz* 7633 (holo: DNA ex NT; iso: BRI, CANB, DNA).

***Illustration*:** Symon (1981: 139)

Erect, rhizomatous perennial shrub, 0.5–1.5 m high. Juvenile stage unknown. Adult branchlets brown; prickles 3–10 per decimetre, straight, acicular, 1–5 mm long, 10–15 times longer than wide; stellae sparse to dense, 0.2–0.3 mm diameter, stalks 0–0.1 mm long; lateral rays 8–13, porrect or multiradiate; central ray absent or present, 0–1 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Adult leaves* ovate, entire or shallowly lobed throughout; lobes 3–5 on each side, acute or obtuse, lobing index 1–1.4; lamina 7.5–13 cm long, 3.5–6 cm wide, 2–3 times longer than broad, apex acute or acuminate, base cuneate, oblique part 0–3 mm long, obliqueness index 0–2 percent; petioles 0.5–2.2 cm long, 5–17% length of lamina, prickles absent. *Upper leaf surface* green; prickles 0–7, straight, acicular, 3–5 mm long, prickles absent or present on midvein only or present on midvein and lateral veins; stellate hairs absent, or confined to midrib; ordinary stellae absent from surface; finger hairs absent; Type 2 hairs absent. *Lower leaf surface* greenish-white; prickles absent; stellae dense, 0.1–0.3 mm apart, 0.3–0.5 mm diameter, sessile; lateral rays 7 or 8, porrect; central ray 0.1–0.5 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Inflorescence* leaf-opposed, pseudo-racemose, common peduncle 3–12 mm long, rachis prickles absent; 5–35-flowered, weakly andromonoecious, flowers 5-merous; pedicels 6–10 mm long at anthesis, same thickness throughout, 0.3–0.4 mm thick at mid-point, prickles absent. Calyx tube 1.5–2.5 mm long, lobes deltate or attenuate, 1–3 mm long; prickles absent at anthesis; stellae moderate to dense, transparent, 0.2–0.3 mm across, sessile, lateral rays 5–8, central ray 1–1.5 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. Corolla white or mauve, 6–8 mm long, deeply lobed, inner surface glabrous; anthers 3.5–5 mm long; ovary glabrous; functional style 4.5–5 mm long, erect, glabrous or with stellate hairs only, stellae 0.2–0.25 mm across, lateral rays 8–9, central ray 0.7–1.5 times as long as laterals. *Fruiting calyx* with lobes less than half length of mature fruit, prickles absent. Mature fruits 1 or 2 per inflorescence, globular, 14–16 mm diameter, red, 1-locular (septum absent or incomplete); placenta not apparent; mesocarp juicy, succulent; exocarp *c.* 0.7 mm thick; pedicels 17–24 mm long in fruit, 0.6–0.8 mm thick at mid-point; seeds pale yellow, 3.5–3.9 mm long.

Specimens examined**: New Guinea.** Bioto, Jul–Aug 1918, *White* 581 (BRI). **Northern Territory.** Dalywoi Bay, Gove, Feb 1988, *Russell-Smith* 4933 & *Lucas* (BRI, DNA); Rocky Bay, Yirrkala, Mar 1988, *Russell-Smith* 5167 & *Lucas* (BRI, DNA); 1.5 km NW of Yirrkala, Nov 1989, *Forster* PIF5976 (BRI, DNA). **Queensland.** Cook District: Newcastle Bay, 2.5 miles [4 km] S of Somerset, May 1948, *Brass* 18720 (BRI, CANB); Bamaga district, Galloways Creek area, undated, *Webb* & *Tracey* 6075 (BRI); upstream of Hann Ck, Jul 1986, *Hind* 4542 *et al.* (NSW); Jardine River N.P., 11 km NNW of the Eliot Creek–Jardine River confluence, 38.1 km S of Bamaga, Oct 1993, *Fell* DGF3647 & *Dibella* (BRI).

Distribution and habitat**:** *Solanum yirrkalense* is known from the northernmost part of Queensland, around Bamaga (**Map 4**). It also grows near Gove in north-eastern Northern Territory, and is known from a single New Guinean specimen. It inhabits coastal vine thickets on sand dunes.

Phenology**:** Flowers have been collected in February and July–August; mature fruits in March, May and November.

Notes**:** *S. yirrkalense* differs from *S. discolor* by the mostly broader leaves with longer petioles, the dense indumentum on the lower leaf surface (*vs.* very dense for *S. discolor*), the central ray on the calyx stellae 1–1.5 times as long as laterals (*vs.* 0.5–1 times for *S. discolor*), inflorescence common peduncle 3–12 mm long (*vs.* 0–2 mm long for *S. discolor*).

Conservation status**:** Not considered at risk.

12. Solanum defensum F.Muell., Fragm. 5: 193 (1866). **Type:** Queensland. Cook District: Cape York Peninsula, undated, *E. Daemel* (lecto: MEL [MEL12284]), here chosen.

Erect, rhizomatous perennial shrub, 1–2.5 m high. Juvenile branchlets with 25–30 prickles per dm, 6–9 mm long; leaves (in outline) elliptical, shallowly-lobed, with 4–6 pairs of lobes; lamina 8–13 cm long, 2.5–4 cm wide, with 10–20 prickles on upper surface. Adult branchlets brown; prickles 1–10 per decimetre, straight, acicular, 4–9 mm long, 13–18 times longer than wide; stellae sparse to dense, 0.25–0.5 mm diameter, sessile; lateral rays 7 or 8, porrect; central ray absent or present, 0–0.4 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Adult leaves* ovate, entire or shallowly lobed throughout; lobes 3–6 on each side, obtuse, lobing index 1–1.4; lamina 7–14.5 cm long, 2.3–5 cm wide, 2.1–3.2 times longer than broad, apex acute or acuminate, base cuneate or obtuse, oblique part 0–2.5 mm long, obliqueness index 0–2 percent; petioles 0.6–1 cm long, 6–10% length of lamina, prickles absent or present. *Upper leaf surface* green; prickles 0–10, straight, acicular, 5–8 mm long, prickles absent or present on midvein only or present on midvein and lateral veins; stellate hairs absent, or confined to midrib; ordinary stellae absent from surface; finger hairs absent; Type 2 hairs absent. *Lower leaf surface* green; prickles 0–4, straight, acicular, absent or present on midvein only or present on midvein and lateral veins; stellae very sparse to moderate, 0.5–1.7 mm apart, 0.4–0.6 mm diameter, sessile; lateral rays 7 or 8, porrect; central ray 0.2–0.6 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Inflorescence* supra-axillary, pseudo-racemose, common peduncle 0–4 mm long, rachis prickles absent; 5–13-flowered, weakly andromonoecious, flowers 5-merous; pedicels 4–8 mm long at anthesis, markedly thicker distally, 0.15–0.25 mm thick at mid-point, prickles absent. Calyx tube 1.5–3 mm long, lobes rostrate, 0.2–1 mm long; prickles absent at anthesis; stellae moderate to dense, transparent, 0.25–0.3 mm across, sessile, lateral rays 7 or 8, central ray 0–0.5 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. Corolla white, mauve or purple, 5–8 mm long, deeply lobed, inner surface sparsely to densely stellate-hairy; anthers 3–4.5 mm long; ovary with stellate hairs only; functional style 3.5–4.5 mm long, erect, with stellate hairs only, stellae *c.* 0.25 mm across, lateral rays 7–10, central ray 0–1 times as long as laterals. *Fruiting calyx* with lobes less than half length of mature fruit, prickles absent. Mature fruits 1 or 2 per inflorescence, globular, 13–17 mm diameter, red, 1-locular (septum absent or incomplete); placenta in cross-section sessile, elliptical; mesocarp juicy, succulent; exocarp 1.2–1.7 mm thick; pedicels 17–28 mm long in fruit, 0.6–0.8 mm thick at mid-point; seeds pale yellow, 3.8–4.3 mm long.

Specimens examined**: Queensland.** Cook District: Leo Creek, Upper Nesbit River, Aug 1948, *Brass* 19947 (BRI); Table Range, Dead Horse Creek, Oct 1973, *Dockrill* 760

(QRS); McIlwraith Range, Sep 1974, *Hyland* 7643, 7658 (BRI, QRS); Lockerbie Scrub, Bamaga, Sep 1974, *Webb & Tracey* 13481 (CANB, QRS); 'Temple Bay' yards, Sep 1976, *Hyland* 8964 (QRS); northern slopes Mt Tozer, Nov 1977, *Webb & Tracey* 13479 (BRI); near Ginger Mick's Mine, 2 km S of Punsand Bay, Feb 1990, *Forster* PIF6403 (BRI); 2.2 km from Captain Billy Landing hut, on the Heathlands road, Mar 1992, *Johnson* 5023 (BRI); Claudie Falls, 2.5 km NE of Mt Tozer, Iron Range N.P., May 1992, *Fell* DF2614 & *Jensen* (BRI, QRS); Turrel Hill, 10 km WNW of Nesbit River mouth, 51.6 km N of 'Silver Plains' HS., Aug 1993, *Fell* DGF3398 *et al.* (BRI, CANB); 1.5 km ENE of Lamond Hill, 8.5 km NNW of Lockhart River community, Mar 1994, *Fell* DGF4139 & *Stanton* (BRI); Round Mountain, Embley Range, 'Silver Plains', Jul 1997, *Forster* PIF21350 *et al.* (AD, BRI, QRS).

***Distribution and habitat*:** *Solanum defensum* is endemic to Queensland; extending from the tip of Cape York Peninsula to the McIlwraith Range near Coen (**Map 5**). It grows in notophyll rainforest, in hilly terrain with infertile soils derived from metamorphic or granitic rocks.

***Phenology*:** Flowers and fruits may be found at any time of the year.

***Notes*:** *S. defensum* is related to *S. discolor*, *S. yirrkalense* and *S. fervens*, but differs from all these species by the green lower leaf surface (stellate hairs absent to sparse), the central ray of the stellae on the calyx only 0–0.5 times as long as laterals, and the thicker fruiting exocarp.

Sterile specimens of *S. defensum* are readily confused with *S. macoorai*. These species are however allopatric.

***Conservation status*:** Not considered at risk.

13. Solanum discolor R.Br., Prodr. 445 (1810). **Type:** [Queensland.] 'Coen River' [Pennefather River], Carpentaria, 7 November 1802, *R. Brown* (lecto: BM).

***Illustration*:** Symon (1981: 141)

Erect, rhizomatous perennial shrub, 0.5–2 m high. Juvenile stage unknown. Adult branchlets yellow or brown; prickles absent or present, 0–10 per decimetre, straight, acicular, 2–6 mm long, 10–16 times longer than wide; stellae very dense, 0.25–0.4 mm diameter, stalks 0–0.1 mm long; lateral rays 7 or 8, porrect; central ray 0.2–0.8 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Adult leaves* lanceolate, elliptical or ovate, entire or shallowly lobed throughout; lobes 3–6 on each side, obtuse, lobing index 1–1.3; lamina 7–10 cm long, 1.6–4.5 cm wide, 2.3–4.3 times longer than broad, apex acute or acuminate, base cuneate, oblique part 0–3 mm long, obliqueness index 0–4 percent; petioles 0.4–0.9 cm long, 4–10% length of lamina, prickles absent. *Upper leaf surface* green; prickles 0–7, straight, acicular, 3–5 mm long, prickles absent or present on midvein only or present on midvein and lateral veins; stellate hairs absent, or confined to midrib; ordinary stellae absent from surface; finger hairs absent; Type 2 hairs absent. *Lower leaf surface* white or yellowish; prickles absent; stellae very dense, *c.* 0.05 mm apart, 0.3–0.5 mm diameter, stalks 0–0.1 mm long; lateral rays 8–9, porrect; central ray 0.1–0.5 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Inflorescence* leaf-opposed or supra-axillary, pseudo-racemose, common peduncle 0–2 mm long, rachis prickles absent; 7–20-flowered, strongly or weakly andromonoecious, flowers 5-merous; pedicels 2–9 mm long at anthesis, same thickness throughout, 0.2–0.4 mm thick at mid-point, prickles absent. Calyx tube 0.5–1.5 mm long, lobes deltate, 0.5–2 mm long; prickles absent at anthesis; stellae dense to very dense, white, 0.25–0.4 mm across, sessile, lateral rays 6–8, central ray 0.5–1 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. Corolla mauve, 3–7 mm long, deeply lobed, inner surface glabrous; anthers 2.5–4 mm long; ovary glabrous. *Fruiting calyx* with lobes less than half length of mature fruit, prickles absent. Mature fruits 1 or 2 per inflorescence, globular, 10–14 mm diameter, red, 1-locular (septum absent or incomplete); placenta not apparent; mesocarp juicy, succulent; exocarp 0.4–0.5 mm thick; pedicels 13–18 mm long in fruit, 0.5–0.8 mm thick at mid-point; seeds pale yellow, 2.6–3.6 mm long.

***Specimens examined*:** **Queensland.** COOK DISTRICT: between Rocky River and Massey Creek, Sep 1973, *Stocker* 1072 (BRI); Mapoon, S of Cullen Point, Port Musgrave, Feb 1981, *Morton* AM1075 (BRI); S bank of Pennefather River, Aug 1983, *Clarkson* 4914 (BRI); 0.7 km W of Bolt Head, Jul 1990, *Clarkson* 8806 & *Neldner* (BRI); 3.5 km NNE of Massey Ck crossing, 'Silver Plains' station, Jul 1993, *Forster* PIF13614 *et al.* (BRI); 6 km W of the Rocky River mouth, 36.2 km ENE of Coen, 'Silver Plains' holding, Aug 1993, *Fell* DGF3479 *et al.* (BRI, MEL); 'Silver Plains', S of Scrubby Creek and W of Colmer Point, Jun 1995, *Forster*

PIF17061 (AD, BRI, MEL, QRS); Bolt Head, Jun 1996, *Gray* 6857 (BRI); Temple Bay, Bolt Head, Jun 1996, *Forster* PIF19359 (BRI).

***Distribution and habitat*:** *Solanum discolor* is endemic to Queensland, occurring on both the east and west coast of Cape York Peninsula, as far north as Mapoon and as far south as 'Silver Plains' (**Map 7**). It occurs in depauperate vine thicket, sometimes with emergent *Araucaria cunninghamii*, on stranded sand dunes.

***Phenology*:** Flowers are recorded for February, June, July and August; mature fruits from June to September.

***Notes*:** *S. discolor* was in the past more broadly circumscribed to include *S. corifolium* F.Muell., but it differs clearly from that species. See notes under *S. corifolium*.

***Conservation status*:** Not considered at risk.

14. Solanum corifolium F.Muell., Fragm. 2: 166 (1861). **Type:** [Queensland.] Araucaria Ranges, Burnett River, Bunya Bunya Ranges, December 1856, *F. Mueller* (lecto: MEL [MEL 11617]; isolecto: K), fide Symon (1981).

***Illustration*:** Symon (1981: 136)

Sprawling or erect, rhizomatous perennial shrub, 0.6–3 m high. Juvenile branchlets with 15–25 prickles per dm; leaves (in outline) ovate, shallowly-lobed, with 2–3 pairs of lobes; lamina 9–11 cm long, 3.5–4.5 cm wide, with 0–20 prickles on upper surface. Adult branchlets yellow; prickles 4–30 per decimetre, straight, acicular, 3–7 mm long, 12–16 times longer than wide; stellae dense to very dense, 0.15–0.25 mm diameter, sessile; lateral rays 6–8, porrect; central ray absent; finger hairs absent; Type 2 hairs absent. *Adult leaves* ovate, entire or shallowly lobed throughout; lobes 2–3 on each side, obtuse, lobing index 1–1.2; lamina 4.5–10.5 cm long, 1.9–5 cm wide, 2–2.9 times longer than broad, apex acute, base cuneate, oblique part 0–1.5 mm long, obliqueness index 0–2 percent; petioles 0.3–1.1 cm long, 6–14% length of lamina, prickles absent. *Upper leaf surface* green; prickles 0–15, straight, acicular, 3–6 mm long, prickles absent or present on midvein only or present on midvein and lateral veins; stellate hairs absent, or confined to midrib; ordinary stellae absent from surface; finger hairs absent; Type 2 hairs absent. *Lower leaf surface* white or yellowish; prickles 0–5, straight, acicular, absent or present on midvein only or present on midvein and lateral veins; stellae very dense, *c.* 0.05 mm apart, 0.15–0.25 mm diameter, sessile; lateral rays 7 or 8, porrect, central ray absent; finger hairs absent; Type 2 hairs absent. *Inflorescence* supra-axillary, pseudo-umbellate or pseudo-racemose, common peduncle 0–3 mm long, rachis prickles absent; 3–10-flowered, with all flowers bisexual and 5-merous; pedicels 6–21 mm long at anthesis, same thickness throughout, 0.3–0.5 mm thick at mid-point, prickles absent. Calyx tube 1–2.5 mm long, lobes deltate or rostrate, 1.5–3 mm long; prickles absent at anthesis; stellae moderate to dense, 0.15–0.25 mm across, sessile, lateral rays 6–8, central ray absent; finger hairs absent; Type 2 hairs absent. Corolla white or mauve, 8–10 mm long, deeply lobed, inner surface glabrous; anthers 4–5.5 mm long; ovary with Type 2 hairs only; functional style 5.5–7 mm long, erect, with Type 2 hairs only or with stellate and Type 2 hairs, stellae *c.* 0.2 mm across, lateral rays 6–7, central ray 0.5–1 times as long as laterals. *Fruiting calyx* with lobes less than half length of mature fruit, prickles absent. Mature fruits 1 or 2 per inflorescence, globular, 7–12 mm diameter, red, 1-locular (septum absent or incomplete); placenta not apparent; mesocarp juicy, succulent; exocarp 0.2–0.7 mm thick; pedicels 10–22 mm long in fruit, 0.6–0.9 mm thick at mid-point; seeds pale yellow, 2.8–3.7 mm long.

***Selected specimens examined*:** **Queensland.** COOK DISTRICT: S.F.607, Bridle L.A., Dec 1973, *Dansie s.n.* (QRS). NORTH KENNEDY DISTRICT: razorback range NW of Mt Dryander, Jul 1974, *Swan* 75 (BRI); Paluma Holding, May 1982, *Dansie* AFO 05151 (QRS); North Gregory, property of D. & R. Clarke, adjacent to Dryander S.F., Jul 1997, *Champion* 1484 & Cali (BRI). PORT CURTIS DISTRICT: Callide Valley, Apr 1937, *White* 11210 (BRI); 'Green Horizons', 8.4 km from Rules Beach Rd along Fingerfield Rd, *c.* 60 km NW of Bundaberg, Oct 1992, *Geckeler et al.* 49 (CANB); S.F.69, SE of Thangool, Mar 1996, *Bean* 10126 (BRI, MEL). BURNETT DISTRICT: Eidsvold, undated, *Bancroft s.n.* (BRI); Bunya Mountains S.F., Mar 1959, *Thorne* 20043a (BRI); Fontainea Scrub, Gurgeena Plateau, S.F.172, Feb 1994, *Forster* PIF14805 (AD, BRI). WIDE BAY DISTRICT: base of Guyra Mount, below Mt Bauple N.P., Feb 1988, *Forster* PIF3535 (BRI); Mt Glastonbury, S.F.242, Dec 1991, *Forster* PIF9277 & *Sharpe* (BRI, MEL). DARLING DOWNS DISTRICT: 'Sunnyvale', Bell, Mar 1927, *Langford s.n.* (BRI); S.F.197 Diamondy, 32 km NE of Jandowae, Mar 1999, *Forster* PIF24098 & *Booth* (BRI, MEL, QRS). MORETON DISTRICT:

Mt Glorious, May 1923, *White* 1953 (BRI); Binna Burra, Lamington N.P., Apr 1959, *Thorne* 20408 (BRI); S.F.289, Yarraman, Feb 1972, *Moriarty* 879 (BRI); Palm Grove N.P., Tamborine Mountain, Jul 1983, *Guymer* 1868 & *McDonald* (AD, BRI, GUAM); Nineteen L.A., T.R.209, Mt Brisbane, Jun 1990, *Forster* PIF6862 *et al.* (BRI, L, MEL, QRS); Murray Grey Drive, Dulong, W of Nambour, Jan 2000, *Bean* 16004 (BRI); Wilkie's Scrub, Wongawallan, 7 km W of Coomera, Jul 2001, *Bean* 17691 (BRI). **New South Wales.** NORTH COAST. Richmond River, *anno* 1876, *Fawcett s.n.* (NSW).

***Distribution and habitat*:** *Solanum corifolium* is common in south-eastern Queensland as far north as Bundaberg and Biloela, and with disjunct occurrences near Proserpine, Ingham and Mareeba. There is an old record from far north-eastern New South Wales (**Map 7**). It grows in Araucarian or other mixed notophyll rainforest, in hilly to mountainous terrain.

***Phenology*:** Flowers are recorded from November to March; the exception is a flowering record from north Queensland in July (*Champion* 1484 & *Cali*); mature fruits are recorded between January and July.

***Notes*:** *S. corifolium* is closely related to *S. discolor*, but differs by the branchlet stellae only 0.15–0.25 mm across (0.25–0.4 mm for *S. discolor*), central ray of branchlet stellae lacking (0.2–0.8 times as long as laterals for *S. discolor*), all flowers bisexual (some flowers male for *S. discolor*), corolla 8–10 mm radius (3–7 mm for *S. discolor*), anthers 4–5.5 mm long (2.5–4 mm long for *S. discolor*), ovary with Type 2 hairs (glabrous for *S. discolor*), and the mostly smaller fruits.

***Conservation status*:** Widespread. Not considered at risk.

15. Solanum mentiens A.R.Bean **sp. nov.** Frutex prostratus caulibus longis serpentibus ad nodos radicantibus; folia ovata 1.5–2.2plo longiora quam latiora, glabra et atrovirentia supra, densissime pilosa subtus, apice acuto; stellae omnes radio centrali carentes; inflorescentia floribus aliquibus functionale maribus; fructus maturitate laete rubra, exocarpio 0.8–1.0 mm crasso. **Typus:** Queensland. MORETON DISTRICT: Bahr's Scrub, 5 km SSW of Beenleigh, J. Davidson property, 19 December 2001, *P.I. Forster* 28047 & *G. Leiper* (holo: BRI (1 sheet + spirit); iso: A, K, L, MEL, NSW).

Solanum discolor var. *procumbens* C.T.White, *Proc. Roy. Soc. Queensland* 55: 71 (1944). **Type:** Queensland. MORETON DISTRICT: Upper Teviot, undated, *B. Scortechini* (holo: MEL).

Prostrate, stoloniferous perennial shrub, *c.* 0.1 m high. Juvenile stage absent. Adult branchlets yellow or brown; prickles absent or present, 0–10 per decimetre, straight, acicular, 2–7 mm long, 8–10 times longer than wide; stellae dense to very dense, 0.15–0.2 mm diameter, sessile; lateral rays 6–8, porrect; central ray absent; finger hairs absent; Type 2 hairs absent. *Adult leaves* elliptical or ovate, entire; lamina 5–7.5 cm long, 2.7–4 cm wide, 1.5–2.2 times longer than broad, apex obtuse, base cuneate or obtuse, oblique part 0–3.5 mm long, obliqueness index 0–6 percent; petioles 0.5–1.1 cm long, 7–20% length of lamina, prickles absent. *Upper leaf surface* green; prickles 0–3, straight, acicular, 2–5 mm long, prickles absent or present on midvein only; stellate hairs absent, or confined to midrib; ordinary stellae absent from surface; finger hairs absent; Type 2 hairs absent. *Lower leaf surface* white or yellowish; prickles absent; stellae very dense, *c.* 0.05 mm apart, 0.2–0.3 mm diameter, sessile; lateral rays 7 or 8, porrect; central ray absent; finger hairs absent; Type 2 hairs absent. *Inflorescence* supra-axillary, solitary or pseudo-racemose, common peduncle 0–3 mm long, rachis prickles absent; 1–6-flowered, weakly andromonoecious, flowers 5-merous; pedicels 6–18 mm long at anthesis, same thickness throughout, 0.3–0.5 mm thick at mid-point, prickles absent. Calyx tube 2–4 mm long, lobes elliptic or deltate, 1–3 mm long; prickles absent at anthesis; stellae moderate, transparent, 0.15–0.25 mm across, sessile, lateral rays 6–8, central ray absent; finger hairs absent; Type 2 hairs absent. Corolla white, 7–12 mm long, shallowly or deeply lobed, inner surface glabrous; anthers 4.5–5.5 mm long; ovary with Type 2 hairs only; functional style 5.5–7 mm long, erect, glabrous or with Type 2 hairs only. *Fruiting calyx* with lobes less than half length of mature fruit, prickles absent. Mature fruits 1–3 per inflorescence, globular, 10–12 mm diameter, red, 1-locular (septum absent or incomplete); placenta in cross-section sessile, semi-circular to elliptical; mesocarp moist but not juicy; exocarp 0.8–1 mm thick; pedicels 22–25 mm long in fruit, 0.8–1 mm thick at mid-point; seeds pale yellow, 2.4–3.2 mm long. **Fig. 18.**

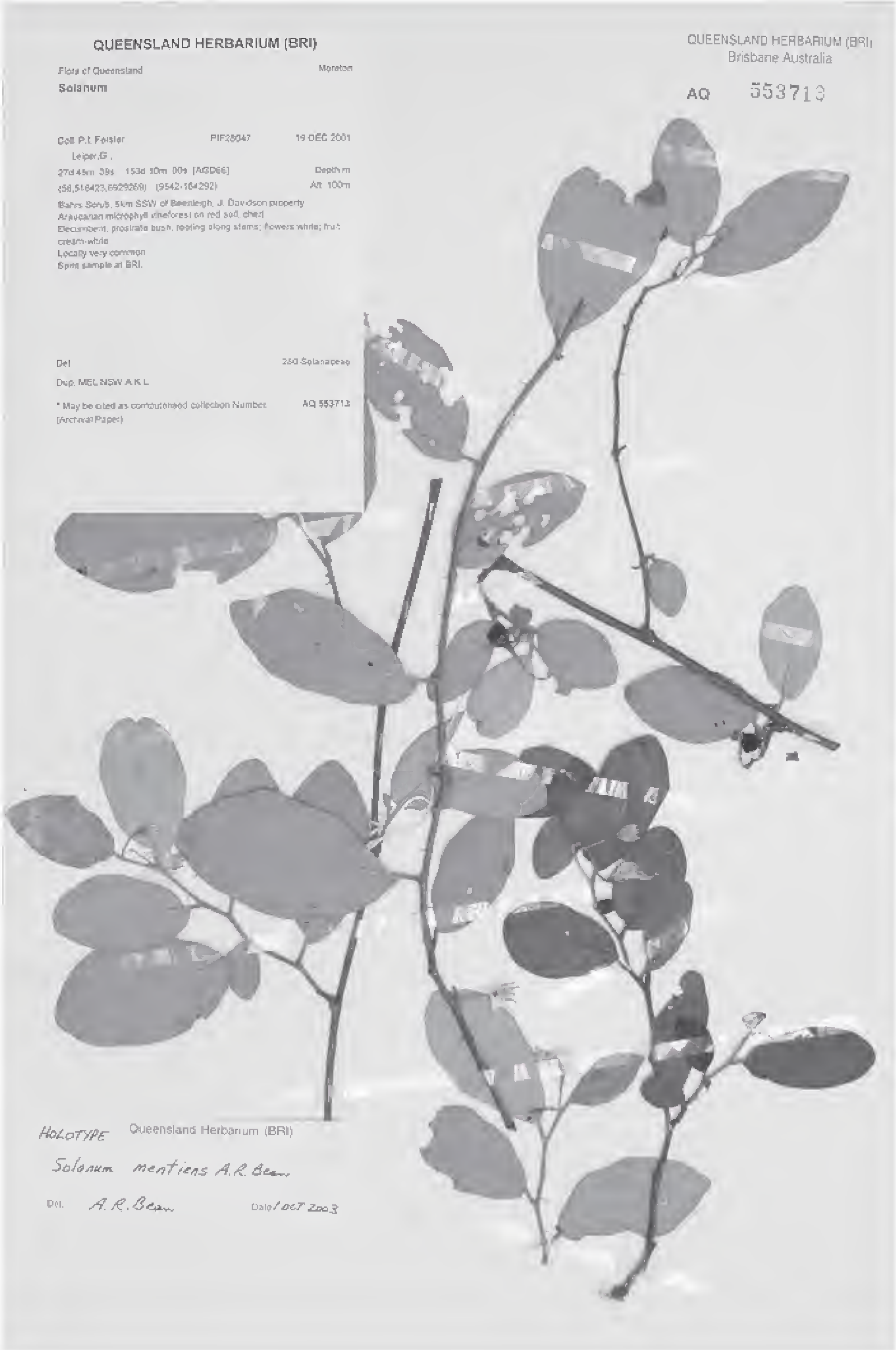

QUEENSLAND HERBARIUM (BRI)
Flora of Queensland
Moreton
Solanum
Coll. P.I. Forster
PIF28047
19 DEC 2001
Leiper, G.
27d 45m 39s 153d 10m 00s [AGD66]
Depth m
(56,516423,6929269) (9542-164292)
Alt 100m
Bahrs Scrub, 5km SSW of Beenleigh, J. Davidson property
Araucarian microphyll vineforest on red soil, chert
Decumbent, prostrate bush, rooting along stems; flowers white; fruit cream-white
Locally very common
Spirit sample at BRI.
Det
250 Solanaceae
Dup. MEL NSW A K L
* May be cited as computerised collection Number
AQ 553713
(Archival Paper)
QUEENSLAND HERBARIUM (BRI)
Brisbane Australia
AQ 553713
HOLOTYPE
Queensland Herbarium (BRI)
Solanum mentiens A.R. Bean
Det. A.R. Bean
Date 1 OCT 2003

Fig. 18. Holotype of ***Solanum mentiens***.

***Specimens examined*:** **Queensland.** Moreton District: near Canungra, May 1917, *White s.n.* (BRI); end of French's Creek road, *c.* 12 km SW of Boonah, Jul 1984, *Bird s.n.* (BRI); Bahr's Scrub, near Beenleigh, Jan 2000, *Leiper s.n.* (BRI); Bahr's Scrub, 5 km SW of Beenleigh, Feb 2001, *Bean* 17370 (BRI, MEL); Bahr's Scrub, 6 km SW of Beenleigh, Feb 2002, *Bean* 18513 (BRI); slopes of Mt French, W of Boonah, Apr 2003, *Bean* 20144 (BRI).

***Distribution and habitat*:** *Solanum mentiens* is endemic to Queensland. Confined to the Boonah and Beenleigh areas in far southeastern Queensland (**Map 5**). It inhabits Araucarian notophyll vineforest.

***Phenology*:** Flowers are recorded for December, January and February; fruits for February and July.

***Notes*:** This species is very distinct in the field due to its ground-hugging prostrate habit. It produces long trailing stems that strike roots frequently at the nodes. The lack of a central ray on any stellae immediately distinguishes *S. mentiens* from the other two species with the same habit (*S. serpens* and *S. acanthodapis*).

Solanum mentiens is closely related to *S. corifolium*, but differs by the prostrate stoloniferous habit, leaves 1.5–2.2 times longer than broad (2.0–2.9 times for *S. corifolium*); leaf apex obtuse (acute for *S. corifolium*); inflorescence with some flowers functionally male (all bisexual in *S. corifolium*); placenta sessile, semicircular to elliptical (not apparent in *S. corifolium*); and exocarp 0.8–1.0 mm thick (0.2–0.7 mm for *S. corifolium*).

The locality of "Upper Teviot" given by Scortechini for his specimen refers to the Teviot Brook, which flows through the town of Boonah.

***Conservation status*:** *S. mentiens* is currently known from 3 locations. Weeds or land clearance threaten all populations. One population may be just within the Mt French National Park. Applying the IUCN guidelines (IUCN. 2001), a category of "Endangered" is recommended (EN B1ab(iii,v)+2ab(iii,v); C1).

***Etymology*:** From the Latin *mentiens*, meaning 'imitating'. This refers to its similarity to *S. corifolium*.

16. Solanum shirleyanum Domin, *Biblioth. Bot.* 89: 578 (1929). **Type:** Queensland. Moreton District: Tamborine Mountain, March 1910, *K. Domin s.n.* (holo: PR (2 sheets)).

Erect, rhizomatous perennial shrub, 0.6–1.8 m high. Juvenile branchlets with 1–20 prickles per dm; leaves (in outline) lanceolate or elliptical or ovate, entire or shallowly-lobed, with 2–3 pairs of lobes; lamina 9–10 cm long, 3–4.2 cm wide, with 2–8 prickles on upper surface. Adult branchlets yellow or brown; prickles absent or present, 0–6 per decimetre, straight, acicular or broad-based, 2–5 mm long, 6–12 times longer than wide; stellae dense to very dense, 0.25–0.4 mm diameter, stalks 0–0.1 mm long; lateral rays 6–8, porrect; central ray 0.5–3 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Adult leaves* elliptical or ovate, entire; lamina 4–11 cm long, 1.5–4 cm wide, 2–3 times longer than broad, apex acute or acuminate, rarely obtuse; base cuneate, oblique part 0–3.5 mm long, obliqueness index 0–3 percent; petioles 0.25–1.3 cm long, 5–12% length of lamina, prickles absent. *Upper leaf surface* green; prickles 0–5, straight, acicular, 4–6 mm long, prickles absent or present on midvein only; stellate hairs confined to midrib, or distributed throughout; protostellae absent; ordinary stellae very sparse, 0.8–4 mm apart, 0.3–0.4 mm across, sessile; lateral rays 6–8, porrect; central ray 1–2 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Lower leaf surface* green or greenish-white; prickles absent; stellae dense, 0.1–0.3 mm apart, 0.3–0.5 mm diameter, sessile; lateral rays 7 or 8, porrect; central ray 1–4 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Inflorescence* supra-axillary, pseudo-umbellate, common peduncle absent; 2–9-flowered, with all flowers bisexual and 5-merous; pedicels 7–17 mm long at anthesis, same thickness throughout, 0.2–0.3 mm thick at mid-point, prickles absent. Calyx tube 2–3 mm long, lobes elliptic, 0.3–1 mm long; prickles absent at anthesis; stellae sparse to moderate, transparent, 0.15–0.25 mm across, sessile, lateral rays 5–7, central ray 1–1.5 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent or present. Corolla mauve, 7–9 mm long, deeply lobed, inner surface glabrous; anthers 3.5–4.5 mm long; ovary with Type 2 hairs only; functional style

5.5–7 mm long, erect, glabrous. *Fruiting calyx* with lobes less than half length of mature fruit, prickles absent. Mature fruits 1 or 2 per inflorescence, globular, 3.5–6 mm diameter, red, glabrous or with a few scattered Type 2 hairs, 1-locular (septum absent or incomplete); placenta not apparent; mesocarp juicy, succulent; exocarp 0.1–0.2 mm thick; pedicels 13–21 mm long in fruit, 0.4–0.7 mm thick at mid-point; seeds pale yellow, 2.6–3 mm long.

***Specimens examined*:** **Queensland.** Wide Bay District: Gympie, undated, *Kenny* (BRI); Peters Ck valley, Conondale Range S.F., above Funnel Hut site, Oct 1982, *McDonald* 3627 (BRI); Goods Rd, S.F.274 Conondale, Feb 1991, *McDonald* 4720 (BRI); Lenthalls Dam scrub, S.F.1294, Oct 1995, *Forster* PIF17915 (BRI); S.F.783, 4 km NW of Montville, May 2001, *Forster* PIF27114 (BRI). Moreton District: Maroochie, Oct 1874, *Bailey* (BRI); Mt Tamborine, 1888, *Simmonds s.n.* (BRI); Palmwoods, May 1907, *White s.n.* (BRI); Currumbin, 1912, *O'Brien* (BRI); eastern foothills of Darlington Range, Upper Ormeau Rd, off Pacific Hwy, Apr 1984, *Williams* 84028 (BRI); Bahr's Scrub, 5 km SW of Beenleigh, Feb 2001, *Bean* 17371 (BRI, NSW); Armitage Creek road, Canungra Army Reserve, 7 km SE of Canungra, Feb 2001, *Bean* 17382 (BRI); Rosins Lookout Conservation Park, Beechmont, Jul 2001, *Forster* PIF27494 *et al.* (BRI). **New South Wales.** North Coast: Tyalgum Ridge, Macpherson Range, *c.* 25 km WNW of Murwillumbah, Dec 1977, *Haegi* 1529 (NSW); 1.1 km along South Chowan road, Nullum S.F., S of Murwillumbah, Apr 2001, *Bean* 17558 (BRI).

***Distribution and habitat*:** *Solanum shirleyanum* occurs in high rainfall areas of southeastern Queensland, and extends to near Murwillumbah in N.S.W. (**Map 6**). It grows on the margins of notophyll rainforest where *Eucalyptus grandis* is often prominent. Soils are infertile, and associated species may include *Caldcluvia paniculosa* and *Callicoma serratifolia*. It occurs at relatively low altitudes, although reaching 560 metres in the Conondale Ranges.

***Phenology*:** Flowers are recorded for October, February and April; mature fruits in February, April, May and July.

***Notes*:** It is related to both *S. stelligerum* and *S. corifolium*, and Domin considered that it was a hybrid between these two species. However, my fieldwork has shown that *S. shirleyanum* should be regarded as a species in its own right. It forms populations uniform in morphology, flowers and fruits freely, and can occur in areas geographically remote from the postulated parents.

It differs from *S. corifolium* by the smaller flowers and fruits, more slender corolla lobes, and leaf stellae with conspicuous central rays. It differs from *S. stelligerum* by the shorter petioles, leaves with stellae all sessile and having shorter central rays, smaller fruits, larger seeds and glabrous style.

***Conservation status*:** Moderately widespread. Not considered at risk.

17. Solanum dryanderense A.R.Bean **sp. nov.** Frutex; aculei ramuli praesentes sed sparse distributi; folia integra ovata, petiolus longitudine 4–11% laminae aequans, supra viridia glabra, subtus pilis stellatis petiolis 0.15–0.25 mm longis, apice acuto usque acuminato; aculei calycis absentes; fructus maturitate rubri, seminibus 3.5–4 mm longis. **Typus:** Queensland. North Kennedy District: *c.* 15 km N of Proserpine, near crest of ridge leading to east summit of Mt Dryander, 21 July 1974, *R.J. Henderson* H2214, *V. Moriarty* & *J. Swan* (holo: BRI).

Solanum sp. (Mt Dryander G.P. Guymer 1743) in Henderson (2002).

Erect, rhizomatous perennial shrub, 1–3 m high. Juvenile stage unknown. Adult branchlets grey or brown; prickles absent or present, 0–10 per decimetre, straight, acicular, 2–6 mm long, 10–18 times longer than wide; stellae very dense, 0.4–0.6 mm diameter, stalks 0–0.2 mm long; lateral rays 6–13, porrect or multiradiate; central ray 0.7–2 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Adult leaves* ovate, entire; lamina 5–10 cm long, 2–4 cm wide, 2.1–3.2 times longer than broad, apex acute or acuminate, base cuneate or obtuse, oblique part 0–1 mm long, obliqueness index 0–2 percent; petioles 0.2–1.1 cm long, 4–11% length of lamina, prickles absent. *Upper leaf surface* green; prickles 0–2, straight, acicular, 1–6 mm long, prickles absent or present on midvein only; stellate hairs absent, or confined to midrib; ordinary stellae absent from surface; finger hairs absent; Type 2 hairs absent. *Lower leaf surface* yellowish; prickles absent; stellae dense, 0.1–0.25 mm apart, 0.4–0.6 mm diameter, stalks 0.15–0.25 mm long; lateral rays 6–8, porrect; central ray 0.7–1.5 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Inflorescence* supra-axillary, solitary or pseudo-umbellate, common peduncle 0-1 mm long; 1 or 2-flowered, flowers 5-merous; pedicels *c.* 9

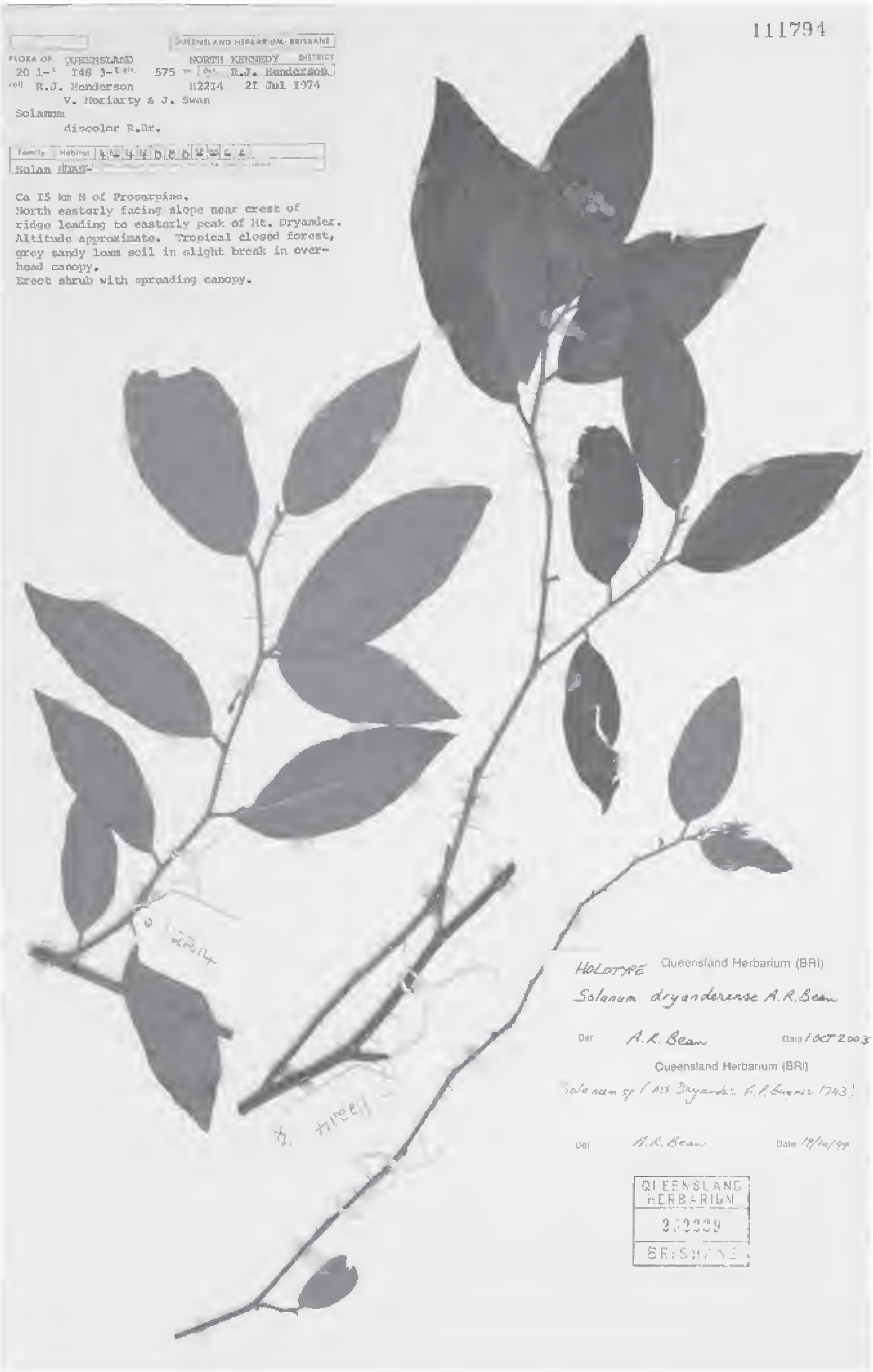

111794
QUEENSLAND HERBARIUM, BRISBANE
FLORA OF QUEENSLAND
NORTH KENNEDY DISTRICT
20 1-1 148 3-Lat. 575 m
Det. R.J. Henderson
coll R.J. Henderson
H2214
21 Jul 1974
V. Moriarty & J. Swan
Solanum
discolor R.Br.
Family
Habitat
Solan
Ca 15 km N of Proserpine.
North easterly facing slope near crest of ridge leading to easterly peak of Mt. Dryander.
Altitude approximate. Tropical closed forest, grey sandy loam soil in slight break in overhead canopy.
Erect shrub with spreading canopy.
HOLOTYPE
Queensland Herbarium (BRI)
Solanum dryanderense A.R.Bean
Det A.R. Bean
Date / OCT 2003
Queensland Herbarium (BRI)
Solanum sp. (Mt Dryander G.R.Guymer 1743)
Det A.R. Bean
Date 19/10/99
QUEENSLAND HERBARIUM
BRISBANE

Fig. 19. Holotype of ***Solanum dryanderense***.

mm long at anthesis, same thickness throughout, 0.4–0.5 mm thick at mid-point, prickles absent. Calyx prickles absent at anthesis; stellae moderate, transparent, *c.* 0.4 mm across, stalks 0–0.1 mm long, lateral rays 6–8, central ray 0.7–1.2 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. 6–7 mm long, deeply lobed, inner surface glabrous; anthers *c.* 5 mm long; functional style *c.* 6 mm long, with Type 2 hairs only. *Fruiting calyx* with lobes less than half length of mature fruit, prickles absent. Mature fruits 1 per inflorescence, globular, 6–7 mm diameter, red, 1-locular (septum absent or incomplete); mesocarp juicy, succulent; pedicels 15–20 mm long in fruit, 0.5–0.6 mm thick at mid-point; seeds pale yellow, 3.5–4 mm long. **Fig. 19.**

***Specimens examined*: Queensland.** NORTH KENNEDY DISTRICT: upper Dryander Creek, Mt Dryander, NE of Proserpine, Oct 1969, *Webb & Tracey* 8354 (BRI); *c.* 15 km N of Proserpine, on mountain spur closely parallel to Mt Dryander Range, Jul 1974, *Henderson* H2178A *et al.* (BRI); *c.* 15 km N of Proserpine, on steep SW slopes of Mt Dryander, Jul 1974, *Henderson* H2216 *et al.* (BRI); Mt Dryander, Jul 1974, *Swan* 77 (BRI); Mt Dryander, Jul 1974, *Swan* 82 (BRI); headwaters of Box Creek, in vicinity of The Bloodwoods, Mt Dryander, May 1982, *Guymer* 1743 (BRI); ridge above Vine Creek, Mt Dryander, N of Proserpine, May 1992, *McDonald* 5098 (BRI).

***Distribution and habitat*:** *Solanum dryanderense* is endemic to Queensland. Known only from Mt Dryander, north of Proserpine (**Map 4**). Most collections have been made between 400 and 600 metres altitude, with one collection given as 200 metres altitude. It inhabits sunny breaks in notophyll rainforest on steep ridges.

***Phenology*:** Very little fertile material is available. A single flower was collected in July, and mature fruits have been collected in May and July.

***Notes*:** *S. dryanderense* is closely related to *S. shirleyanum*, but differs by the larger stellae of the calyx and branchlets, the stellae of the lower leaf surface with stalks 0.15–0.25 mm long (sessile for *S. shirleyanum*), calyx stellae *c.* 0.4 mm diameter (0.15–0.25 mm daimeter for *S. shirleyanum*) and seeds 3.5–4 mm long (2.6–3 mm long for *S. shirleyanum*).

Conservation status: *S. dryanderense* is known only from Mt Dryander near Proserpine, where it is protected within a National Park. Applying the IUCN guidelines (IUCN. 2001), a category of "Vulnerable" is recommended (VU D1+2).

***Etymology*:** The epithet refers to Mt Dryander near Proserpine, the only known locality for the species.

18. Solanum stelligerum Sm., Exot. Bot. 2: 57, t. 88 (1805). *Solanum stelligerum* var. *stelligerum* Benth., Fl. Austral. 451 (1868) **Type:** New South Wales. Port Jackson, 1792, *J. White* (holo: LINN, *n.v.*, microfiche 365.13)

Solanum lucorum Domin, *Repert. Spec. Nov. Regni Veg.* 12: 130 (1913). *Solanum stelligerum* var. *lucorum* F. Muell. ex Benth. Fl. Austral. 451 (1868). **Type:** [Queensland.] Araucaria Ranges, Burnett River, December 1856, *F. Mueller* (holo: K; iso: MEL [MEL 14113]).

***Illustration*:** Symon (1981: 129)

Erect, rhizomatous perennial shrub, 0.8–2.5 m high. Juvenile branchlets with 20–60 prickles per dm; leaves (in outline) lanceolate, shallowly-lobed, with 1 or 2 pairs of lobes; lamina 4–7 cm long, 1.3–2.4 cm wide, with 1–5 prickles on upper surface. Adult branchlets yellow or brown; prickles absent or present, 0–10 per decimetre, straight, acicular, 6–10 mm long, 14–18 times longer than wide; stellae sparse to very dense, 0.3–0.5 mm diameter, stalks 0–0.4 mm long; lateral rays 7 or 8, porrect; central ray 1–4 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent or sparse. *Adult leaves* lanceolate or ovate, entire; lamina 2.5–13 cm long, 0.9–4.5 cm wide, 1.8–3.5 times longer than broad, apex obtuse or acute, base cuneate or obtuse, oblique part 0–3 mm long, obliqueness index 0–5 percent; petioles 0.4–1.8 cm long, 11–16% length of lamina, prickles absent. *Upper leaf surface* green; prickles 0–3, straight, acicular, 6–9 mm long, prickles absent or present on midvein only; stellate hairs confined to midrib, or distributed throughout; protostellae absent; ordinary stellae absent from surface to sparse, 0.5–1.5 mm apart, 0.3–0.8 mm across, sessile; lateral rays 4–8, porrect; central ray 1.5–5 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Lower leaf surface* white or yellowish; prickles absent; stellae dense to very dense, 0.05–0.1 mm apart, 0.3–0.6 mm diameter, stalks 0–0.6 mm long; lateral rays 7 or 8, porrect; central ray 1.5–4 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Inflorescence* supra-axillary, solitary or pseudo-racemose, common peduncle 1–2 mm long, rachis prickles absent; 1–5-flowered, weakly andromonoecious or with all flowers bisexual, flowers 5-merous; pedicels 8–15 mm long at anthesis, same thickness throughout or markedly thicker distally, 0.4–0.6 mm thick at mid-point, prickles absent. Calyx tube 1.5–3 mm long, lobes deltate or rostrate, 0.5–3 mm long; prickles absent at anthesis; stellae very dense, yellow or white, 0.25–0.4 mm across, stalks 0–0.1 mm long, lateral rays 7 or 8, central ray 1–4 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent, or present. Corolla white, mauve or purple, 6–12 mm long, shallowly or deeply lobed, inner surface glabrous; anthers 4–5.5 mm long; ovary with Type 2 hairs only, or with stellate and Type 2 hairs; functional style 5.5–8 mm long, erect, with Type 2 hairs only or with stellate and Type 2 hairs, stellae 0.25–0.4 mm across, lateral rays 6–7, central ray 1–3 times as long as laterals. *Fruiting calyx* with lobes less than half length of mature fruit, prickles absent. Mature fruits 1–4 per inflorescence, globular, 6.5–9 mm diameter, red, glabrous or with a few scattered stellate hairs, 1-locular (septum absent or incomplete); placenta not apparent; mesocarp juicy, succulent; exocarp 0.25–0.5 mm thick; pedicels 14–21 mm long in fruit, 0.6–0.7 mm thick at mid-point; seeds pale yellow, 1.9–2.2 mm long. *Devil's Needles.*

***Selected specimens examined*: Queensland.** NORTH KENNEDY DISTRICT: Selheim, 25 km E of Charters Towers, Mar 1988, *Collins* MPA44 (BRI); 'Fanning River', *c.* 25 km NW of Mingela, Aug 1989, *Fell* FAN83 & *Cumming* (BRI). PORT CURTIS DISTRICT: Marmor near Rockhampton, Mar 1920, *Francis* (BRI); Mt Morgan, Jul 1938, *Goy* 327 (BRI); western slopes of Mt Larcom Range, near Yarwun, May 1971, *Webb & Tracey* 10592A (BRI, CANB); Mt Etna, Oct 1976, *Hyland* 9099 (QRS); Burnett Range, 0.5 km NW of Mt Fort William, May 1977, *Crisp* 2701 (AD, BRI, CANB); Kroombit Tableland, *c.* 60 km SW of Gladstone, Jun 1977, *Crisp* 2850 (AD, BRI, CANB); S.F.69, SE of Thangool, Jun 1996, *Bean* 10432 (BRI, MEL). BURNETT DISTRICT: 2.5 km from Proston on road to weir, May 1996, *Bean* 10287 (BRI, MEL); *c.* 5 km due ENE of Ceratodus railway junction, E of the Burnett River, Apr 1997, *Pollock* ABP575 (BRI); Mt Blandy, 4 km W of Mingo Crossing, Mar 1999, *Forster* PIF24152 & *Booth* (AD, BRI, QRS); Bunya Mountains, 1.8 km along Nanango road, Jun 2001, *Bean* 17676 (BRI); Hoggs Rd, Tingoora, N of Kingaroy, Nov 2001, *Bean* 18103 (BRI, MEL). WIDE BAY DISTRICT: Kin Kin, Mar 1916, *Francis & White* (BRI); near bank of Kolan River, about N of Gin Gin, Apr 1945, *Blake* 15519 & *Webb* (BRI); Yerra, 15 miles [24 km] W of Maryborough, Jan 1954, *Cross* (BRI); south of Anderson road, 10 km W of Cooroy, Nov 1993, *Bean* 7064 (BRI); Pine Creek scrub, 1 km E of Electra, Oct 1996, *Forster* PIF 20049 & *Leiper* (BRI, MEL). DARLING DOWNS DISTRICT: Cunningham's Gap, Main Range, Jul 1930, *White* 6867 (BRI); The Head, near border fence, Jun 1980, *Williams* 80067 (BRI); behind Greenwood churchyard, N of Oakey, Oct 1998, *Fensham* 3505 (BRI); May Road, W of Clifton, Jan 2002, *Bean* 18357 (BRI, CANB). MORETON DISTRICT: scrub below Enoggera Dam, Aug 1874, *Bailey s.n.* (BRI); Benarkin S.F., Blackbutt, Aug 1967, *Henderson* H293 (BRI); Falls Creek, 4.5 km NW of West Haldon, May 1987, *Forster* PIF2933 & *Bird* (BRI); Mt Davidson, 5 km S of Withcott, Jul 1990, *Forster* PIF6903 & *Bird* (BRI, MEL, QRS); S.F.258 Mt Binga, 11 km SE of Cooyar, Feb 2000, *Bean* 16058 (BRI, MEL); Back Creek road, Canungra Army Reserve, 5 km SE of Canungra, Feb 2001, *Bean* 17380 (BRI). **New South Wales.** NORTH COAST: Lismore, Jul 1894, *Baeuerlen* 1267 (AD, BRI, CANB, MO, NSW); Mt Warning, Tweed River, Aug 1916, *Boorman* (AD, BRI, NSW); Branch Road, Dalmorton S.F., SW of Grafton, Jan 2001, *Bean* 17257 (BRI); 2.5 km along Carnham Road, Fine Flower, NW of Grafton, Feb 2001, *Bean* 17335 (BRI, MEL, NSW).

***Distribution and habitat*:** *Solanum stelligerum* is a widespread species ranging from Bodalla in southern New South Wales to Rockhampton in Queensland, with a disjunct occurrence near Charters Towers (**Map 8**). It inhabits margins of notophyll rainforest or shrubby eucalypt open-forest, on many soil types and at low to high altitudes. It is the most commonly encountered native species in eastern coastal Australia.

***Phenology*:** Flowers and fruits may be found at any time of the year.

***Notes*:** Most closely related to *S. parvifolium* subsp. *parvifolium*, but differs by the broader leaves (1.8–3.5 times longer than wide), stellae on all plant parts with a long central ray (1–5 times as long as laterals), the presence of long-stalked stellae (to 0.6 mm long) on the lower leaf surface, the rusty tomentum at least on the veins of the lower leaf surface, and the shallowly lobed juvenile leaves (entire for *S. parvifolium* subsp. *parvifolium*).

***Conservation status*:** Widespread. Not considered at risk.

19. Solanum parvifolium R.Br., Prodr. 446 (1810). **Type:** [Queensland. PORT CURTIS DISTRICT:] Broadsound, 18 September 1802, *R. Brown* [Bennett No. 2673] (lecto: BM; isolecto: K), *fide* Symon (1981).

Solanum accedens Domin, *Repert. Spec. Nov. Regni Veg.* 12: 130–1 (1913). **Type:** Queensland. Rockhampton, undated, *J. Dallachy s.n.* (holo: K).

Two subspecies are recognised, and are distinguished by the following key:

Leaves 2.5–7 × 0.5–1.5 cm, Type 2 hairs absent; ovary with Type 2 hairs only; style 3.5–6.5 mm long; flowers all bisexual .... ***S. parvifolium*** subsp. ***parvifolium***

Leaves 7.5–13.5 × 1.3–3.5 cm, Type 2 hairs present; ovary either without indumentum or with both stellate hairs and Type 2 hairs; style 7.0–9.0 mm long; male flowers consistently present in the inflorescence .... ***S. parvifolium*** subsp. ***tropicum***

19a. Solanum parvifolium subsp. parvifolium

***Illustration*:** Symon (1981: 131)

Erect, rhizomatous perennial shrub, 0.5–1.2 m high. Juvenile stage unknown. Adult branchlets grey or brown; prickles 1–20 per decimetre, straight, acicular, 0.5–7 mm long, 10–18 times longer than wide; stellae sparse to dense, 0.2–0.4 mm diameter, sessile; lateral rays 6–8, porrect; central ray 0.2–1 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs sparse. *Adult leaves* linear or narrow lanceolate, entire; lamina 2.5–7 cm long, 0.5–1.5 cm wide, 3.7–7.5 times longer than broad, apex obtuse or acute, base cuneate, oblique part 0–3 mm long, obliqueness index 0–4 percent; petioles 0.2–0.9 cm long, 7–16% length of lamina, prickles absent. *Upper leaf surface* green; prickles absent; stellate hairs confined to midrib, or distributed throughout; protostellae absent; ordinary stellae very sparse, 0.8–5 mm apart, 0.3–0.5 mm across, sessile; lateral rays 7 or 8, porrect; central ray 0.8–1.2 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Lower leaf surface* white or yellowish; prickles absent; stellae very dense, *c.* 0.05 mm apart, 0.2–0.5 mm diameter, stalks 0–0.1 mm long; lateral rays 7–9, porrect; central ray 0.2–1 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Inflorescence* supra-axillary, solitary or pseudo-racemose, common peduncle 0–4 mm long, rachis prickles absent; 1–8-flowered, with all flowers bisexual and 5-merous; pedicels 7–13 mm long at anthesis, same thickness throughout, 0.4–0.7 mm thick at mid-point, prickles absent. Calyx tube 1.5–3 mm long, lobes deltate, 1–3 mm long; prickles absent at anthesis; stellae dense, yellow or white, 0.25–0.4 mm across, sessile, lateral rays 7 or 8, central ray 0.2–1 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. Corolla purple, 7–9 mm long, shallowly or deeply lobed, inner surface glabrous; anthers 3.5–5 mm long; ovary with Type 2 hairs only; functional style 3.5–6.5 mm long, erect, with Type 2 hairs only or with stellate and Type 2 hairs, stellae 0.3–0.4 mm across, lateral rays 7 or 8, central ray *c.* 0.3 times as long as laterals. *Fruiting calyx* with lobes less than half length of mature fruit, prickles absent. Mature fruits 1–6 per inflorescence, globular, 6–8 mm diameter, red, 1-locular (septum absent or incomplete); placenta not apparent; mesocarp juicy, succulent; pedicels 11–27 mm long in fruit, 0.5–0.7 mm thick at mid-point; seeds pale yellow, 1.9–2.3 mm long.

***Selected specimens examined*:** **Queensland**. NORTH KENNEDY DISTRICT: 14 km E of 'Mt Cooper' HS, Jun 1992, *Thompson* CHA141 & *Sharpe* (AD, BISH, BRI). MITCHELL DISTRICT: base of Great Dividing Range on W side, Sep 1984, *O'Keeffe* 600 (BRI). SOUTH KENNEDY DISTRICT: Alpha, Sep 1959, *Macartney* (BRI); 'Strathmore', 14 miles [23 km] W of Collinsville, May 1960, *Johnson* 1804 (BRI). LEICHHARDT DISTRICT: Moura–Baralaba road, *c.* 8 miles [13 km] from Baralaba, May 1960, *Johnson* 1701 (BRI); Dipperu N.P., *c.* 24 km S of Nebo, Sep 1971, *McDonald* 152 (BRI); Yatton Ck, on Sarina–Marlborough road, *c.* 93 km from Marlborough, Jul 1974, *Moriarty* 1543 (BRI, CANB); Dry Creek valley, Ka Ka Mundi section, Carnarvon N.P., Aug 1990, *McDonald* 4615 & *Bean* (BRI); Melaleuca creek scrub, 'Rookwood', Apr 1991, *Forster* PIF7937 & *McDonald* (BRI, QRS); 'Moorang', 30.7 km ENE of Taroom, Nov 1996, *Halford* Q3110 & *Dowling* (BRI); Cannondale scrub, Expedition N.P., Amphitheatre section, Nov 1998, *Forster* PIF23841 & *Booth* (BRI, MEL, QRS); 20 km S of Injune, Dec 1999, *McDonald* KRM165 (BRI). PORT CURTIS DISTRICT: Ogmore, Sep 1943, *Blake* 15312 (BRI); regional experiment Station, Biloela, Feb 1957, *Daniels* 30 (BRI); *c.* 29 km SW of Ridgelands, Fitzroy Shire, Apr 1990, *Anderson* 4847 (BRI); 15 km NE of Biloela, 3 km N of Callide Dam, Jul 1992, *Thompson* BIL7 (AD, BRI, NSW); near Gumigil Mine, Marlborough, Dec 1998, *Batianoff* 981227 *et al.* (BRI). WARREGO DISTRICT: 13 km NE of 'Etona', Jul 1977, *Purdie* 734D (BRI). MARANOA DISTRICT: Combabula S.F., 28 km NE of Yuleba, Jul 1990, *Warrian* CMW518 (BRI); 'Wombil Downs' station, *c.* 40 km NW of Dirranbandi, Dec 1999, *Franks* AJF9911046 (BRI); Surat–Yuleba road, *c.* 17 km from Surat, Apr 2001, *Bean* 17649 & *Pedley* (BRI, PRE). DARLING DOWNS DISTRICT: Brookvale Park, 8 km from Oakey, Jun 1993, *Alcock* 11265 (AD, BRI, CANB, K, MO); 14 km N of Goondiwindi, towards Moonie, Feb 1996, *Bean* 9904 (BRI); 2.0 km S of 'Wyaga', NE of Goondiwindi, Nov 1999, *Bean* 15873 (BRI, MEL, MO, NSW); 7.8 km N of Miles, Oct 2000, *McDonald* KRM249 (BRI). **New South Wales**. NORTH WESTERN SLOPES: Boronga Nature Reserve, 14.4 km E of Boomi, Sep 2001, *Bean* 17890 (BRI, MEL, NSW); 13.7 km E of North Star, Sep 2001, *Bean* 17902 (BRI). North West Plains: 8 miles [13 km] from Collarenebri, on the road to Walgett, Nov 1967, *McGillivray* 2803 (NSW); Watervale Reserve, 16 miles [26 km] N of Moree, Oct 1968, *McBarron* 15727 (BRI, NSW); 'Warivan', 7.4 km S of North Star on road to Warialda, Sep 1988, *Moore* 8833 (CANB).

***Distribution and habitat*:** *Solanum parvifolium* ssp. *parvifolium* is widespread from the north-western plains of N.S.W. to Charters Towers in Queensland (**Map 6**). It grows in Brigalow scrubs, vine thickets and in shrubby eucalypt woodland, on a variety of soils.

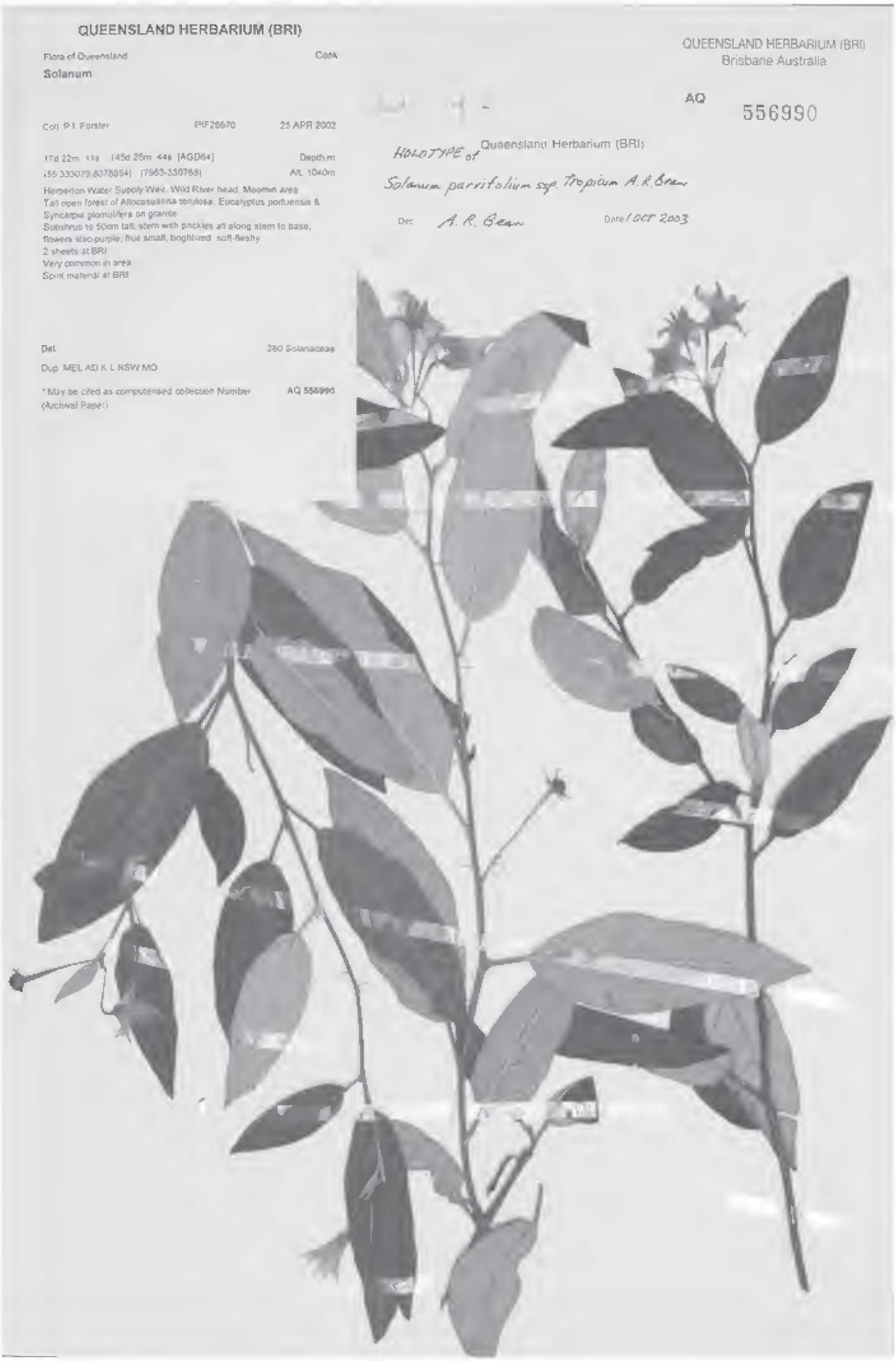
***Phenology*:** Flowers and fruits may be found at any time of the year.

***Notes*:** Most closely related to *S. stelligerum*, and apparently intergrading with it in the Rockhampton area, and also in the Bunya Mtns–Warwick area. *S. parvifolium* ssp. *parvifolium* differs by its narrower leaves, 3.7–7.5 times longer than broad (*vs.* 1.8–3.5 times for *S. stelligerum*), tomentum not rusty (*vs.* at least some rusty coloured stellae on leaf undersides for *S. stelligerum*) and with stellae central ray (leaf undersides) 0.2–1 times as long as laterals (*vs.* 1.5–4 times as long as laterals for *S. stelligerum*), and the lack of long-stalked stellae on midrib of leaf undersides.

***Conservation status*:** Widespread. Not considered at risk.

19b. Solanum parvifolium subsp. **tropicum** A.R.Bean **subsp. nov.** affinis *S. parvifolio* sens. str. sed foliis longioribus latioribusque, in pagina superiore folii pilis Type 2 et indumento stellato induta, stylo longiore et praesentia constante florum masculorum in inflorescentia differens. **Typus:** Queensland. North Kennedy District: Herberton water Supply Weir, Wild River head, Moomin area, 25 April 2002, *P.I. Forster* 28670 (holo: BRI (2 sheets + spirit); iso: AD, K, L, MEL, MO, NSW).

Erect, rhizomatous perennial shrub, 0.6–1.5 m high. Juvenile stage unknown. Adult branchlets grey or brown or green; prickles 1–20 per decimetre, straight, acicular, 4–7 mm long, 8–18 times longer than wide; stellae sparse to dense, 0.3–0.6 mm diameter, stalks 0–0.2 mm long; lateral rays 6–8, porrect; central ray 0.1–0.8 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Adult leaves* linear or narrow lanceolate, entire; lamina 7.5–13.5 cm long, 1.3–3.5 cm wide, 3.3–7 times longer than broad, apex acute, base cuneate or obtuse, oblique part 0–2 mm long, obliqueness index 0–3 percent; petioles 0.7–1.3 cm long, 7–13% length of lamina, prickles absent. *Upper leaf surface* green; prickles absent; stellate hairs distributed throughout; protostellae absent; ordinary stellae very sparse to moderate density, 0.3–3 mm apart, 0.3–0.5 mm across, sessile; lateral rays 6–8, porrect; central ray 0.7–1.5 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs present throughout, 0.1–1.5 mm apart. *Lower leaf surface* white; prickles absent; stellae very dense, *c.* 0.05 mm apart, 0.4–0.6 mm diameter, sessile; lateral rays 7 or 8, porrect; central ray 0.3–1 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Inflorescence* supra-axillary, pseudo-racemose, common peduncle 0–6 mm long, rachis prickles absent; 2–6-flowered, strongly or weakly andromonoecious, flowers 4 or 5-merous; pedicels 14–24 mm long at anthesis, markedly thicker distally, 0.4–0.8 mm thick at mid-point, prickles absent. Calyx tube 1.5–3 mm long, lobes attenuate, 2–3.5 mm long; prickles absent at anthesis; stellae dense to very dense, yellow or brown or rusty, 0.3–0.5 mm across, sessile, lateral rays 7 or 8, central ray 0.5–1.5 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. Corolla purple, 9–15 mm long, rotate or shallowly lobed, inner surface glabrous; anthers 4.5–6.5 mm long; ovary glabrous, or with stellate and Type 2 hairs; functional style 7–9 mm long, erect, glabrous or with Type 2 hairs only or with stellate and Type 2 hairs, stellae *c.* 0.4 mm across, central ray *c.* 0.5 times as long as laterals. *Fruiting calyx* with lobes less than half length of mature fruit, prickles absent. Mature fruits 1 per inflorescence, globular, 5–7 mm diameter, red, 1-locular (septum absent or incomplete); placenta not apparent; mesocarp juicy, succulent; exocarp *c.* 0.3 mm thick; pedicels 26–33 mm long in fruit, 0.5–1 mm thick at mid-point; seeds pale yellow, 2–2.4 mm long. **Fig. 20.**



QUEENSLAND HERBARIUM (BRI)

Flora of Queensland Cook

Solanum

Coll P I Forster PIF28670 25 APR 2002

17d 22m 11s 145d 26m 44s [AGD84] Depth m

(55 333079 8078954) [7963-330788] Alt. 1040m

Herberton Water Supply Weir, Wild River head, Moomin area

Tall open forest of Allocasuarina torulosa, Eucalyptus portuensis & Syncarpia glomulifera on granite

Subshrub to 50cm tall, stem with prickles all along stem to base, flowers lilac-purple, fruit small, bright-red, soft-fleshy

2 sheets at BRI

Very common in area

Spirit material at BRI

Det. 280 Solanaceae

Dup. MEL AD K L NSW MO

* May be cited as computerised collection Number AQ 556990

(Archival Paper)

QUEENSLAND HERBARIUM (BRI)

Brisbane Australia

AQ 556990

HOLOTYPE of Queensland Herbarium (BRI)

Solanum parvifolium ssp. tropicum A.R.Bean

Det. A. R. Bean Date 1 OCT 2003

Fig. 20. Holotype of ***Solanum parvifolium*** subsp. ***tropicum.***

Specimens examined: **Queensland.** Cook District: track to Wallum Trig, Atherton Tablelands, Sep 1977, *Powell* 672 & *Armstrong* (BRI, NSW); Turkey Scrub, 'Whitewater', Jan 1993, *Fensham* 345 (BRI); Mt Baldy S.F., SW of Atherton, Apr 2002, *Bean* 18869 & *McDonald* (BRI). North Kennedy District: Mt Fox, Sep 1949, *Clemens s.n.* (BRI); 41 km from 'Reedy Brook' towards 'Mt Fox', Aug 1972, *Gittins* 2508 (BRI); 'Jervoise' Holding, May 1979, *Hyland* 9931 (BRI, QRS); Forty Mile scrub N.P., 60 km SSW of Mt Garnet, Jan 1990, *Batianoff* 900133 & *Smith* (BRI); Mt Abbot, 50 km W of Bowen, Mar 1992, *Bean* 4220 (BRI); Mt Moti, Bluewater Range, WNW of Townsville, May 1996, *Cumming* 14700 (BRI); Hugh Nelson Range, SE of Herberton, Jan 1998, *Jago* 4641 & *Wannan* (BRI).

Distribution and habitat: *Solanum parvifolium* ssp. *tropicum* is endemic to Queensland. Extends from Mt Abbot (near Bowen) to Atherton, and west to Forty Mile Scrub N.P. and Jervoise Holding (**Map 6**). It inhabits rainforest margins or "wet sclerophyll" forest with shrubby understorey.

***Phenology*:** Flowers are recorded from January to April and for September; mature fruits for January and August.

***Notes*:** Typical *S. parvifolium* ssp. *tropicum* differs from *S. parvifolium s. str.* by the longer and broader leaves, the upper leaf surface with Type 2 hairs, the longer pedicels, the ovary either glabrous or with both stellate hairs and Type 2 hairs, the longer style and the presence of male flowers in the inflorescence. Some collections, notably from the Forty Mile Scrub, are morphologically somewhat intermediate between the subspecies.

***Conservation status*:** Widespread. Not considered at risk.

***Etymology*:** From the Latin *tropicus*, meaning tropical. This refers to the distribution of the subspecies.

20. Solanum ferocissimum Lindl. in T.Mitch., Three Exped. Australia 2: 58 (1838); *S. ferocissimum var. ferocissimum* Domin, Biblioth. Bot. 89: 580 (1929). **Type:** New South Wales. near Burradorgang, 28 April 1836, *T.L. Mitchell* (holo: CGE; iso: K, MEL).

Solanum leptophyllum F.Muell., Fragm. 2: 164 (1861). **Types:** between Mackenzie and Dawson Rivers, *F. Mueller* (syn: ?MEL, *n.v.*); Castlereagh River, *E. Bowman* (syn: ?MEL, *n.v.*); ad oppidulum Warwick, *H. Beckler* (syn: ?K, *n.v.*); Barrier Range, *H. Beckler* (syn: ?K, *n.v.*); Mt Murchison, *J. Dallachy* (syn: K, MEL).

Solanum ferocissimum var. *rectispinum* Domin, Biblioth. Bot. 89: 580 (1929). **Types:** Dividing Range near Jericho, Queensland, Mar 1910, *K. Domin* (syn: PR, *n.v.*); Peels Range, New South Wales, undated, *Frazer* (syn: BM, K, OXF, *fide* Symon (1981)); Peels Range, New South Wales, undated, *A. Cunningham* (syn: BM, *fide* Symon (1981)).

***Illustrations*:** Cunningham *et al.* (1981: 594); Symon (1981: 133)

Erect, rhizomatous perennial shrub, 0.4–1.5 m high. Juvenile branchlets with *c.* 20 prickles per dm; leaves (in outline) linear or linear-hastate, with basal lobes only; lamina 7–12 cm long, 0.8–1.2 cm wide. Adult branchlets white, grey or brown; prickles 15–60 per decimetre, straight, acicular, 2–10 mm long, 9–13 times longer than wide; stellae sparse to very dense, 0.25–0.4 mm diameter, sessile; lateral rays 7 or 8, porrect; central ray absent or present, 0–0.8 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Adult leaves* linear, entire or with obtuse basal lobes only; lamina 3–7.5 cm long, 0.2–0.7 cm wide, 9–26 times longer than broad, apex obtuse or acute, base cuneate or hastate, oblique part 0–1 mm long, obliqueness index 0–2 percent; petioles 0.4–1 cm long, 8–20% length of lamina, prickles absent. *Upper leaf surface* green; prickles 2–6, straight, acicular, 2–9 mm long, prickles present on midvein only; stellate hairs confined to midrib, or distributed throughout; protostellae absent; ordinary stellae very sparse to sparse, 0.4–0.8 mm apart, 0.25–0.35 mm across, sessile; lateral rays 4–8, porrect; central ray 0–1 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Lower leaf surface* green to white or yellowish; prickles 0–4, straight, acicular, absent or present on midvein only; stellae sparse to very dense, 0.05–0.7 mm apart, 0.2–0.7 mm diameter, sessile; lateral rays 6–8, porrect; central ray 0–0.5 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Inflorescence* supra-axillary, pseudo-racemose, common peduncle 0–7 mm long, rachis prickles absent; 2–10-flowered, strongly or weakly andromonoecious or with all flowers bisexual, flowers 4 or 5-merous; pedicels 6–13 mm long at anthesis, same thickness throughout, 0.2–0.4 mm thick at mid-point, prickles absent. Calyx tube 1–2 mm long, lobes deltate or rostrate, 0.7–1.5 mm long; prickles absent at anthesis; stellae moderate to very dense, yellow, 0.3–0.5 mm across, sessile, lateral rays 7 or 8, central ray 0.5–1 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. Corolla white or mauve, 6–12 mm long, deeply lobed, inner surface glabrous; anthers 3.5–5.5 mm long; ovary glabrous, or with stellate and Type 2 hairs; functional style 4.5–6.5 mm long, erect, glabrous or with stellate and Type 2 hairs, stellae *c.* 0.4 mm across, lateral rays 7 or 8, central ray 0.5–1 times as long as laterals. *Fruiting calyx* with lobes less than half length of mature fruit, prickles absent. Mature fruits 1–4 per inflorescence, globular, 6–9 mm diameter, red, glabrous or with a few scattered Type 2 hairs, 1-locular (septum absent or incomplete); placenta not apparent; mesocarp juicy, succulent; exocarp *c.* 0.1 mm thick; pedicels 13–16 mm long in fruit, 0.5–0.6 mm thick at mid-point; seeds pale yellow, 3–3.6 mm long.

***Specimens examined*: Queensland.** BURKE DISTRICT: Southern Roads, 20 km N of Mt Isa, Dec 1996, *Barrs* SB93 (BRI). GREGORY NORTH DISTRICT: S of Selwyn, May 1963, *Gittins* 700 (BRI). MITCHELL DISTRICT: 'Oxenhope' on the Alroy road, *c.* 130 km SSW of Longreach, Apr 1989, *Emmott* 285 (BRI); Blacks Palace, 80 km S of Jericho, May 1989, *Cheffins* 377 (BRI). LEICHHARDT DISTRICT: *c.* 9 km SW of Anakie, Sep 1984, *Anderson* 3816 (BRI); Telecom road, 14 km E of Comet, Mar 1994, *Bean* 7524 & *Forster* (BRI). WARREGO DISTRICT: 'Gilruth Plains', Cunnamulla, Apr 1963, *McKee* 10347 (BRI); 19 km S of Charleville along road to Wyandra, Mar 1976, *Purdie* 215 & *Boyland* (BRI); 15.1 km S of Corona Creek, on Quilpie–Adavale road, Aug 1990, *Prendergast* HDP283 (BRI); Monks Tank road, Idalia N.P., Feb 2000, *Nicholls* SN010 (BRI). MARANOA DISTRICT: 'Boatman' Station, Mar 1947, *Everist* 2780 (BRI); 'Glade Villa', S of Roma, Aug 1990, *Warrian* CMW543 (BRI, NSW); *c.* 41 km along Shirlo road, NW of Bollon, Mar 2001, *Bean* 17540 (BRI, MEL); near 'Boxleigh', *c.* 60 km NE of St George, Apr 2001, *Bean* 17641 & *Pedley* (BRI, MO). DARLING DOWNS DISTRICT: Myall Park, 4 miles [6 km] NW of Glenmorgan, Apr 1960, *Johnson* 1605 (BRI); 5 miles [8 km] W of Westmar, Jul 1961, *Pedley* 788 (BRI); 'Coomrith' area near Meandarra, Jul 1969, *Webb* & *Tracey* 8298 (BRI); Yelarbon, around cemetery, *c.* 1 km from P.O., Oct 1983, *Canning* 5821 & *Rimes* (BRI, CANB, NSW); 2.0 km S of 'Wyaga', NE of Goondiwindi, Nov 1999, *Bean* 15868 (AD, BRI, MEL, NSW).

***Distribution and habitat*:** *Solanum ferocissimum* is distributed throughout much of inland Queensland south of about 20° latitude (**Map 9**), and extending well into New South Wales and Northern Territory. Also recorded by Symon (1981) for Western Australia. It inhabits stony ridges or flats, on red earths or loamy soil, in woodlands often dominated by *Eucalyptus populnea, E. melanophloia* or *Acacia aneura.*

***Phenology*:** Flowers and fruits may be found at any time of the year, probably in response to rainfall.

Notes: *S. ferocissimum* is close to *S. parvifolium* ssp. *parvifolium*, but differs by the often sparse, sessile indumentum; leaves linear in shape, frequently with a pair of basal leaf lobes, with prickles along the midrib on both surfaces; and by the seeds 3.0–3.6 mm long (1.9–2.3 mm long for *S. parvifolium* ssp. *parvifolium*).

Ross (1986) suggested that *S. ferocissimum* is doubtfully distinct from *S. parvifolium.* While it is true that some collections are taxonomically difficult, the great majority of collections may be easily determined.

***Conservation status*:** Widespread. Not considered at risk.

21. Solanum latens A.R.Bean **sp. nov.** Frutex parvus; aculei in ramulis frequentes, aciculares; folia adulta parva, 4.7–7plo longiora quam latiora, saepe lobata, aliquando integra; pili stellati in superficiebus ambabus folii sessiles, radio centrali radiis lateralibus 1.5–3plo longiore; corolla profunde lobata; calyx aculeis carens; fructus maturitate rubri, seminibus 1.6–2.3 mm longis. **Typus:** Queensland. BURNETT DISTRICT: Conservation Gully, 'Narayen', W of Mundubbera, 16 December 2001, *A.R. Bean* 18292 (holo: BRI (2 sheets + spirit); iso: AD, MEL, NSW).

Solanum sp. (Kingaroy A.R. Bean 17428) on BRI database

Erect, rhizomatous perennial shrub, 0.4–1.1 m high. Juvenile branchlets with 35–50 prickles per dm, 3–6 mm long; leaves (in outline) linear-hastate, shallowly to deeply lobed, with 1 or 2

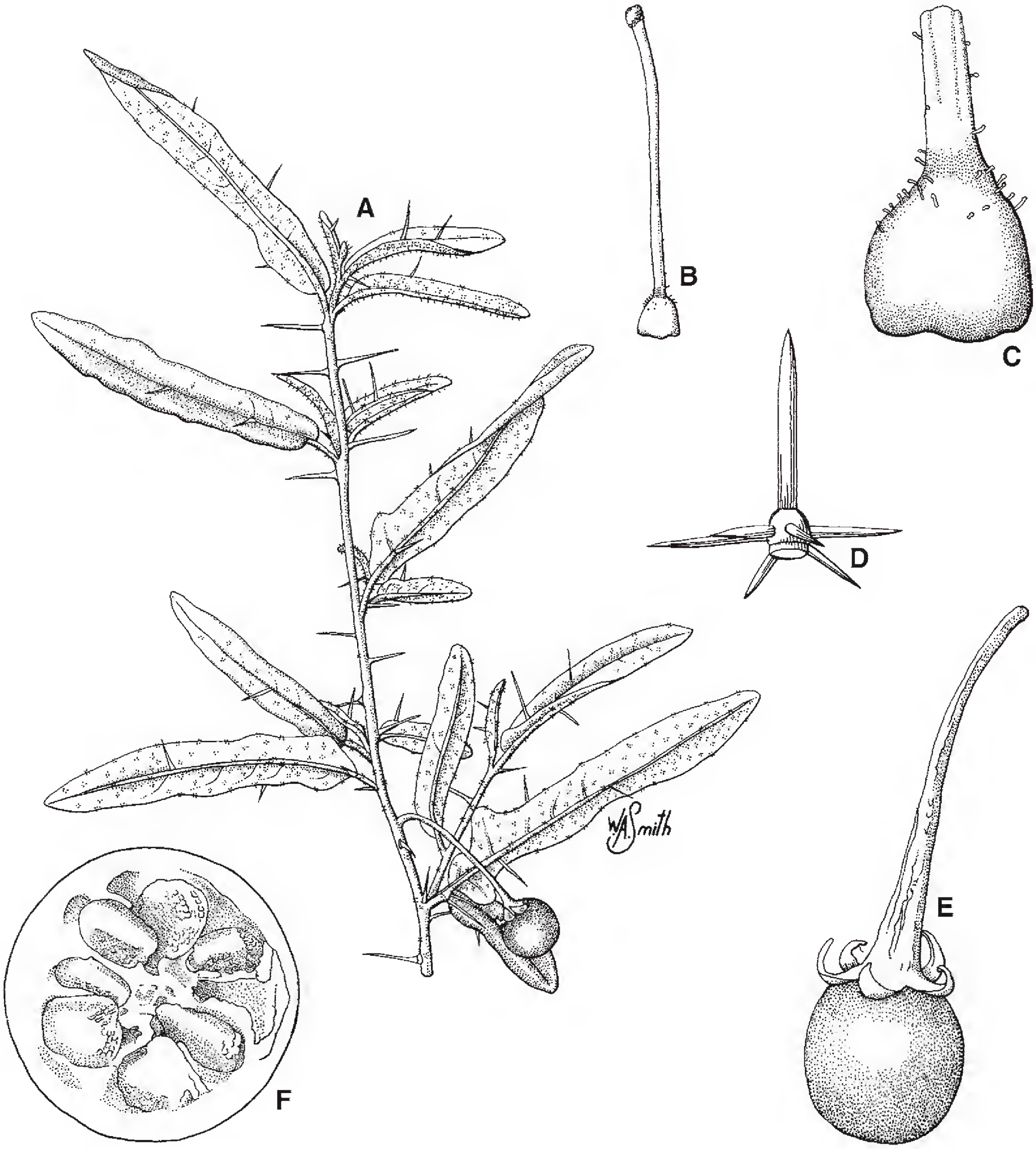


Fig. 21. ***Solanum latens***. A. fruiting branchlet × 1.2. B. style and ovary × 6. C. ovary showing Type 2 hairs × 30. D. stellate hair from upper leaf surface × 60. E. mature fruit and pedicel × 3. F. transverse section of fruit × 6. A, D–F, *Bean* 17432; B–C, *Bean* 18295.

pairs of lobes; lamina 2.5–4.5 cm long, 0.5–1.3 cm wide, with 9–16 prickles on upper surface. Adult branchlets green; prickles 15–30 per decimetre, straight, acicular, 5–9 mm long, 13–18 times longer than wide; stellae sparse, 0.25–0.5 mm diameter, sessile; lateral rays 4–7, porrect; central ray 0.5–1 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs sparse. *Adult leaves* narrow lanceolate or lanceolate, entire or shallowly lobed throughout or with basal lobes only; lobes 1 or 2 on each side, obtuse, lobing index 1–1.2; lamina 1.5–4.5 cm long, 0.3–0.8 cm wide, 4.5–7.5 times longer than broad, apex obtuse or acute, base cuneate or hastate, oblique part 0–2.5 mm long, obliqueness index 0–6 percent; petioles 0.3–0.6 cm long, 8–16% length of lamina, prickles absent. *Upper leaf surface* green; prickles 2–6, straight, acicular, 4–6 mm long, prickles present on midvein only; stellate hairs confined to midrib, or distributed throughout; protostellae absent; ordinary stellae very sparse to sparse, 0.8–2.5 mm apart, 0.35–0.5 mm across, sessile; lateral rays 4–7, porrect; central ray 1.5–3 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Lower leaf surface* green; prickles 0–3, straight, acicular, absent or present on midvein only; stellae very sparse to moderate, 0.3–2 mm apart, 0.3–0.7 mm diameter, sessile; lateral rays 6–8, porrect; central ray 1.5–3 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Inflorescence* supra-axillary, solitary or pseudo-umbellate, common peduncle 0–2 mm long; 1–3-flowered, with all flowers bisexual and 5-merous; pedicels 8–18 mm long at anthesis, same thickness throughout, *c.* 0.3 mm thick at mid-point, prickles absent or present. Calyx tube 1.5–2 mm long, lobes attenuate, 1.5–2.5 mm long; prickles absent at anthesis; stellae sparse to moderate, transparent, 0.2–0.4 mm across, sessile, lateral rays 6–8, central ray 0.8–1.5 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. Corolla mauve, 6–8 mm long, deeply lobed, inner surface glabrous; anthers 3–4.5 mm long; ovary with Type 2 hairs only; functional style 4–6 mm long, erect, with Type 2 hairs only. *Fruiting calyx* with lobes less than half length of mature fruit, prickles absent. Mature fruits 1 per inflorescence, globular, 4–6.5 mm diameter, red, glabrous or with a few scattered Type 2 hairs, 1-locular (septum absent or incomplete); placenta not apparent; mesocarp juicy, succulent; exocarp 0.2–0.3 mm thick; pedicels 14–24 mm long in fruit, 0.5–0.6 mm thick at mid-point; seeds pale yellow, 1.6–2.3 mm long. **Fig. 21.**

***Specimens examined*: Queensland**. LEICHHARDT DISTRICT: 'Kooralbyn', *c.* 25 km S of Duaringa, Feb 2003, *Bean* 19985 (BRI, CANB, MO). BURNETT DISTRICT: Kingaroy, Apr 1947, *Smith* 3004 (BRI); *c.* 14 km NNE of Eidsvold, Oct 1993, *Lepschi & Slee* 1216 (BRI, CANB); Semgreen Road, SSE of Kingaroy, Mar 2001, *Bean* 17428 (BRI, CANB, MEL, NSW); Goodger Gully Rd, SSE of Kingaroy, Mar 2001, *Bean* 17432 (BRI, NSW); Kunioon West, S of Kingaroy, Nov 2001, *Bean* 18121 (BRI); Valley Dam paddock, 'Narayen', W of Mundubbera, Dec 2001, *Bean* 18295 (BRI, MEL, NSW); S.F.227, *c.* 30 km E of Cracow, Jul 2002, *Bean* 19129 (B, BRI, CANB, L, MEL); S.F.132 Allies Creek, *c.* 55 km S of Mundubbera, Nov 2002, *Bean* 19610 (BRI, MEL). DARLING DOWNS DISTRICT: Burraburri Creek, 16 km W of Durong, May 1992, *Forster* PIF9857 (AD, BRI); 3.8 km NE of Warra, on Marnhull road, Feb 2003, *Bean* 19961 (BRI, NSW).

***Distribution and habitat*:** *Solanum latens* is endemic to Queensland. It is confined to subcoastal south-eastern Queensland, extending from Duaringa to Warra, and near Kingaroy. (**Map 9**). It occurs as an understorey plant in Brigalow-Belah communities, or in microphyll vine forest, or in *Eucalyptus* or *Acacia* dominated woodland on tertiary-aged plateaux.

***Phenology*:** Flowers are recorded for February, May, November and December; mature fruits in May and December

***Notes*:** Closely related to *S. ferocissimum*, but differing by the smaller and broader leaves; juvenile leaves often with 2 pairs of lobes; upper and lower leaf stellae with central ray 1.5–3 times as long as laterals (0–1 times for *S. ferocissimum*); the 1–3 flowered inflorescences (2–10 flowered for *S. ferocissimum*); and the seeds 1.6–2.3 mm long (3.0–3.6 mm for *S. ferocissimum*).

***Conservation status*:** Moderately widespread. Not considered at risk.

***Etymology*:** From the Latin *latens* meaning 'secret' or 'hidden'. This is a reference to the late recognition of the species, with most collections being in the last decade.

22. Solanum dissectum Symon, Austrobaileya 4: 432–3 (1995). **Type:** Queensland. PORT CURTIS DISTRICT: west of Thangool, 2 July 1959, *R.W. Johnson* 858 (holo: BRI; iso: BRI).

***Illustration*:** Symon (1995: 432)

Erect, rhizomatous perennial shrub, 0.3–0.8 m high. Juvenile branchlets with *c.* 7 prickles per dm, 7–10 mm long; leaves (in outline) ovate, deeply lobed, with 2–5 pairs of lobes; lamina 5.5–7 cm long, 3–4 cm wide, with 2–3 prickles on upper surface. Adult branchlets grey or brown; prickles 3–10 per decimetre, straight, acicular, 4–11 mm long, 9–13 times longer than wide; stellae absent; finger hairs absent; Type 2 hairs absent. *Adult leaves* ovate or broadly ovate, deeply lobed throughout; lobes 2–4 on each side, acute or obtuse, lobing index 7–22; lamina 2–5.5 cm long, 0.9–2.5 cm wide, 1.5–2.9 times longer than broad, apex obtuse or acute, base cuneate or obtuse, oblique part 0–1.5 mm long, obliqueness index 0–5 percent; petioles 0.3–1.2 cm long, 12–25% length of lamina, prickles absent or present. *Upper leaf surface* green; prickles 0–4, straight, acicular, 1–7 mm long, prickles absent or present on midvein only; stellate hairs absent; finger hairs absent; Type 2 hairs present only in vein depressions. *Lower leaf surface* green; prickles 0–4, straight, acicular, absent or present on midvein only; stellae absent; finger hairs absent; Type 2 hairs absent. *Inflorescence* supra-axillary, pseudo-racemose, common peduncle 0–2 mm long, rachis prickles absent; 2–5-flowered, with all flowers bisexual and 5-merous; pedicels 6–8 mm long at anthesis, markedly thicker distally, 0.4–0.5 mm thick at mid-point, prickles absent. Calyx tube 1–2 mm long, lobes rostrate, 1–2.5 mm long; prickles absent at anthesis; stellae absent; finger hairs absent; Type 2 hairs absent. Corolla mauve, 6–9 mm long, deeply lobed, inner surface glabrous; anthers 2.5–4 mm long; ovary with Type 2 hairs only; functional style 4–6.5 mm long, erect, glabrous. *Fruiting calyx* with lobes less than half length of mature fruit, prickles absent. Mature fruits 1 per inflorescence, globular, 7–9 mm diameter, red, 1-locular (septum absent or incomplete); placenta not apparent; mesocarp juicy, succulent; exocarp 0.2–0.3 mm thick; pedicels 10–19 mm long in fruit, 0.5–1 mm thick at mid-point; seeds pale yellow, 3–4.1 mm long.

***Specimens examined*: Queensland.** LEICHHARDT DISTRICT: McCrae property, 50 miles [80 km] S of Duaringa, Jul 1966, *Everist & McDonald* 3 (BRI); Portion 2, Parish of Capayan, Banana Shire, Feb 1989, *Philips s.n.* (BRI); 'Nirvana', *c.* 15 km WNW of Banana, Apr 2003, *Bean* 20167 (BRI). PORT CURTIS DISTRICT: *c.* 6 miles [10 km] W of Biloela, Jul 1959, *Johnson* 870 (BRI); Biloela near roadside, Sep 1966, *Stevens s.n.* (BRI); *c.* 22 km S of Dululu, Sep 1989, *Clamfield* 4776 (BRI).

***Distribution and habitat*:** *Solanum dissectum* is endemic to Queensland, and recorded from the Biloela–Banana–Baralaba area (**Map 11**). It occurs in association with brigalow (*Acacia harpophylla*), and sometimes *Eucalyptus thozetiana*, on heavy cracking-clay soil.

***Phenology*:** Poorly known. Flowers are recorded for September; mature fruits in February, April and July.

***Notes*:** *S. dissectum* is a very distinct species with no very close relatives. It is probably closest to *S. lythrocarpum* (see notes under that species). It is also close to *S. ferocissimum*, but it differs from that species by the total lack of stellate hairs and the deeply lobed adult leaves.

***Conservation status*:** *S. dissectum* is currently known from a total of 17 mature individuals at one locality, and this locality is not protected within a conservation reserve. Applying the IUCN guidelines (IUCN. 2001), a category of "Critically Endangered" is recommended (CR A3ce; B1ab(iii,v)+2ab(iii,v); C1+2a(i,ii); D). Three specimen labels include comments indicating the probable imminent demise of that population of *S. dissectum viz.* "cleared Brigalow scrub", "pulled *Acacia harpophylla* regrowth", "recently burnt, pulled brigalow suckers". Major threats are continuing land clearance, and invasion of habitat by exotic species of grass, introduced as cattle fodder. This species is undoubtedly the one closest to extinction in Queensland.

23. Solanum lythrocarpum A.R.Bean **sp. nov.** Frutex parvus, aculei in ramulis praesentes sed sparsi; folia integra, angusto-lanceolata, utrinque laete viridia; pili Type-2 in ramulis folii lamina calyceque; pili stellati in foliis et calyce sparsissimus; aculei calycis absentes; styli 5.7–6.8 mm longi; fructus maturitate rubra. **Typus:** Queensland. BURNETT DISTRICT: east of Scrubby Dam, Coominglah State Forest, near Monto, 11 December 1998, *A.R. Bean* 14430 (holo: BRI (1 sheet + spirit); iso: AD, MEL, NSW).

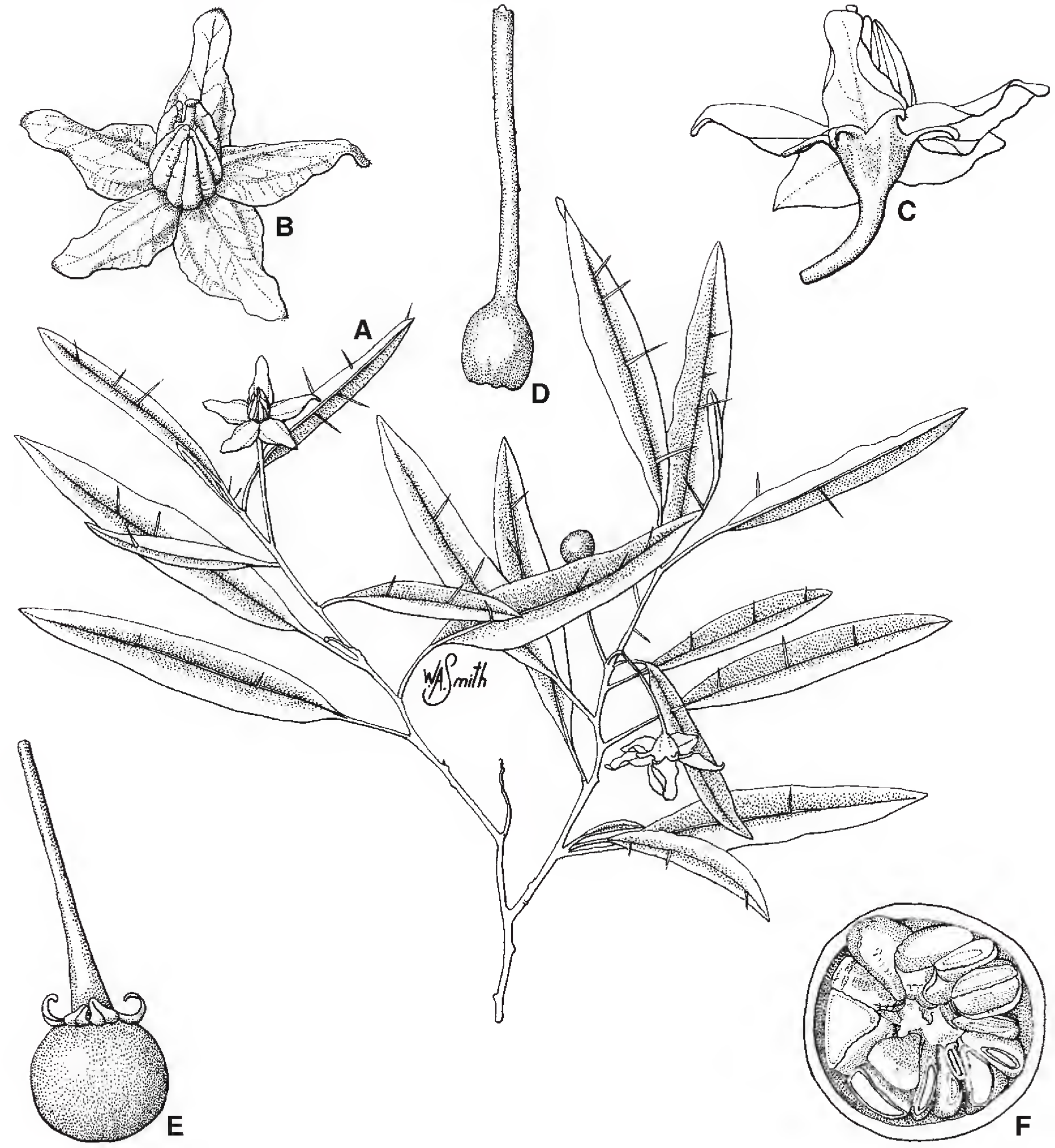


Fig. 22. ***Solanum lythrocarpum***. A. flowering and fruiting branchlet × 1. B. flower showing style and anthers × 3. C. flower showing hypanthium and calyx lobes × 3. D. ovary and style × 6. E. mature fruit and pedicel × 2. F. transverse section of fruit × 3. A, *Bean* 10389; B–D, *Bean* 14430; E–F, *Bean* 15936.

Solanum sp. (Coominglah A.R. Bean 10389) in Henderson (2002).

Erect, rhizomatous perennial shrub, 0.3–0.9 m high. Juvenile stage unknown. Adult branchlets brown; prickles absent or present, 0–6 per decimetre, straight, acicular, 0.5–5 mm long, 7–10 times longer than wide; stellae absent or sparse, 0.2–0.3 mm diameter, stalks 0–0.1 mm long; lateral rays 4–8, porrect; central ray 0.5–1.5 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs sparse to dense. *Adult leaves* narrow lanceolate or lanceolate, entire; lamina 5–9.5 cm long, 1.1–1.5 cm wide, 4.7–7 times longer than broad, apex acute, base cuneate, oblique part 0–2.5 mm long, obliqueness index 0–3 percent; petioles 0.9–2.1 cm long, 11–23% length of lamina, prickles absent or present. *Upper leaf surface* green; prickles 0–4, straight, acicular, 3–7 mm long, prickles absent or present on midvein only; stellate hairs absent, or confined to midrib; ordinary stellae absent from surface; finger hairs absent; Type 2 hairs present throughout, 0.1–0.5 mm apart. *Lower leaf surface* green; prickles 0–3, straight, acicular, absent or present on midvein only; stellae absent; finger hairs absent; Type 2 hairs absent. *Inflorescence* leaf-opposed, pseudo-racemose, common peduncle 0–7 mm long, rachis prickles absent; 3–8-flowered, with all flowers bisexual and 4 or 5-merous; pedicels 9–24 mm long at anthesis, same thickness throughout or markedly thicker distally, 0.4–0.7 mm thick at mid-point, prickles absent. Calyx tube 1.5–2.5 mm long, lobes attenuate, 2–6 mm long; prickles absent at anthesis; stellae absent to sparse, white, 0.15–0.3 mm across, sessile, lateral rays 4–8, central ray 0–1 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs present. Corolla purple, 7–11 mm long, shallowly or deeply lobed, inner surface glabrous; anthers 3–5 mm long; ovary glabrous, or with Type 2 hairs only; functional style 5.5–7 mm long, erect, glabrous. *Fruiting calyx* with lobes less than half length of mature fruit, prickles absent. Mature fruits 1–4 per inflorescence, globular, 8–11 mm diameter, red, 1-locular (septum absent or incomplete); placenta not apparent; mesocarp juicy, succulent; exocarp 0.4–0.5 mm thick; pedicels 18–24 mm long in fruit, 0.6–0.8 mm thick at mid-point; seeds pale yellow, 3–3.7 mm long. **Fig. 22.**

***Specimens examined*: Queensland.** BURNETT DISTRICT: Sixteen Mile L.A., Coominglah S.F., south-west of Monto, Mar 1996, *Bean* 10155 (BRI); W edge of Bogdanoff L.A., Coominglah S.F., south-west of Monto, Jun 1996, *Bean* 10389 (BRI, NSW, MEL); northern boundary of S.F.132, S of Mundubbera, Nov 2002, *Bean* 19627 (BRI).

***Distribution and habitat*:** *Solanum lythrocarpum* is endemic to Queensland. It is known from two small areas near the towns of Monto and Mundubbera (**Map 10**). It grows on lateritised plateaux in ironbark-*Acacia blakei* forest with a dense shrubby understorey including some rainforest species. Associated species include *Croton insularis, Phebalium nottii, Bertya opponens* and *Philotheca ciliata*.

***Phenology*:** Flowers are recorded for June and December; mature fruits recorded for March, November and December.

***Notes*:** *S. lythrocarpum* is related to *S. dissectum*, but differs by the entire adult leaves (deeply lobed for *S. dissectum*); the presence of Type 2 hairs on the branchlets, leaf lamina and calyx (absent for *S. dissectum*); the presence of stellate hairs on leaves and calyx (absent for *S. dissectum*) and the fruiting pedicels 10–19 mm long (18–24 mm long for *S. dissectum*).

***Conservation status*:** *S. lythrocarpum* known from two localities, neither of which is within a conservation reserve. Applying the IUCN guidelines (IUCN. 2001), a category of “Vulnerable” is recommended (VU D1+2). In the Coominglah State Forest, less than 300 plants are known; 30–40 plants occur at the Mundubbera site.

***Etymology*:** From the Greek ‘*lythron*’ meaning blood, and ‘*carpos*’ (fruit), in reference to the bright-red colour of the mature fruits.

24. Solanum chenopodinum F.Muell., Fragm. 2: 165 (1861). **Type:** New South Wales. “Mount Murchison and Darling”, undated, *J. Dallachy s.n.* (lecto: MEL [MEL 11705], *fide* Symon 1981).

***Illustrations*:** Cunningham *et al.* (1981: 594); Symon (1981: 149)

Erect, rhizomatous perennial shrub, 0.4–1 m high. Juvenile branchlets with *c.* 7 prickles per dm, *c.* 6 mm long; leaves (in outline) hastate, shallowly-lobed or with basal lobes only, with 1 or 2 pairs of lobes; lamina 8–11.5 cm long, 4.5–6 cm wide, without prickles on upper surface. Adult branchlets white or grey or yellow; prickles absent or present, 0–10 per decimetre, straight or curved, broad-based, 2–7 mm long, 4–7 times longer than wide; stellae very dense, 0.2–0.5 mm diameter, stalks 0–0.2 mm long; lateral rays 7–10, porrect or ascending; central ray present, 0.2–1 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Adult leaves* ovate or triangular, with obtuse basal lobes only; lamina 2.5–6.5 cm long, 1.1–2.6 cm wide, 1.4–3 times longer than broad, apex obtuse or acute, base cuneate, obtuse, cordate or hastate, oblique part 0–4 mm long, obliqueness index 0–10 percent; petioles 0.5–2 cm long, 15–35% length of lamina, prickles absent. *Upper leaf surface* green; prickles absent; stellate hairs distributed throughout; protostellae absent; ordinary stellae very sparse to sparse, 0.4–0.7 mm apart, 0.2–0.4 mm across, sessile; lateral rays 5–10, porrect; central ray 0.7–1.5 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Lower leaf surface* white or yellowish; prickles absent; stellae dense to very dense, 0.05–0.1 mm apart, 0.4–0.5 mm diameter, stalks 0–0.1 mm long; lateral rays 8–13, porrect; central ray 0.5–1 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Inflorescence* supra-axillary, pseudo-racemose, common peduncle 0–10 mm long, rachis prickles absent; 6–20-flowered, with all flowers bisexual and 5-merous; pedicels 4–6 mm long at anthesis, same thickness throughout, 0.5–0.7 mm thick at mid-point, prickles absent. Calyx tube 1.5–2 mm long, lobes deltate, 1–2.5 mm long; prickles absent at anthesis; stellae dense to very dense, white, 0.25–0.4 mm across, stalks 0–0.1 mm long, lateral rays 8–10, central ray 0.7–1.5 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. Corolla mauve or purple, 5–8 mm long, deeply lobed, inner surface glabrous; anthers 3.5–4.5 mm long; ovary glabrous; functional style 5.5–7 mm long, erect, glabrous. *Fruiting calyx* with lobes less than or more than half length of mature fruit, prickles absent. Mature fruits 1–11 per inflorescence, globular, 7–8 mm diameter, red; mesocarp juicy, succulent; pedicels 8–12 mm long in fruit, 0.7–1 mm thick at mid-point; seeds pale yellow, 3.5–3.8 mm long.

***Specimens examined*:** **Queensland.** Gregory North District: 'Currawilla', Jun 1947, *Everist* 4025 (BRI); Spring Creek, 11 km S of 'Warra', Jun 1978, *Purdie* 1243 (BRI); Simpson Desert, *c.* 20 km NW of Pulchera Waterhole, Aug 1978, *Jahnke* 1310 (BRI); Warracoola Waterhole, Diamantina N.P., Apr 1995, *Mitchell* 951 (BRI); near Mistake Hut dam, Bladensberg N.P., S of Winton, Mar 1998, *Forster* PIF22228 & *Booth* (BRI). Gregory South District: Nockatunga, Jun 1936, *Blake* 11880 (BRI); Murungeri waterhole, 'Nappa Merrie' Station, Jun 1988, *Conrick* 2325 (AD, BRI).

***Distribution and habitat*:** *Solanum chenopodinum* is found in arid to semi-arid areas of south-west Queensland (**Map 11**). Also occurs widely in low rainfall parts of New South Wales, South Australia and Northern Territory. It occurs in shrubland on flats or watercourses on sandy or clayey soil.

***Phenology*:** Flowers are recorded in March, June and August; mature fruits from March to June.

***Notes*:** This species and *S. ferocissimum* are the only red-fruited *Solanum* species that occur in arid parts of Australia. Both species may have a hastate leaf base, but *S. chenopodinum* differs by the much broader leaves without prickles on the upper surface, the broad-based prickles on the branchlets, and the shorter fruiting pedicels.

***Conservation status*:** Data deficient.

25. Solanum dysprosium A.R.Bean sp. nov.

Frutex; aculei ramuli leviter vel distincte recurvi; ramuli classibus duabus pilorum stellatorum, longitudine radii centralis differentibus; folia adulta 4 vel 5 paribus loborum non profundorum, petiolis aculeos gerentibus et longitudine 19–33% laminae aequantibus; stellae in pagina inferiore folii 0.5–0.8 mm diametro; digiti apicibus glandularibus in calyce praesentes. **Typus:** Queensland. Cook District: Cape Melville National Park, western slopes, 26 November 2001, *K.R. McDonald* 1026 & *H. Hines* (holo: BRI).

Erect, rhizomatous perennial shrub, *c.* 0.75 m high. Juvenile stage unknown. Adult branchlets mauve or brown; prickles 25–50 per decimetre, straight, acicular, 3–8 mm long, 9–12 times longer than wide; stellae sparse, 0.25–0.5 mm diameter, stalks 0–0.1 mm long; lateral rays

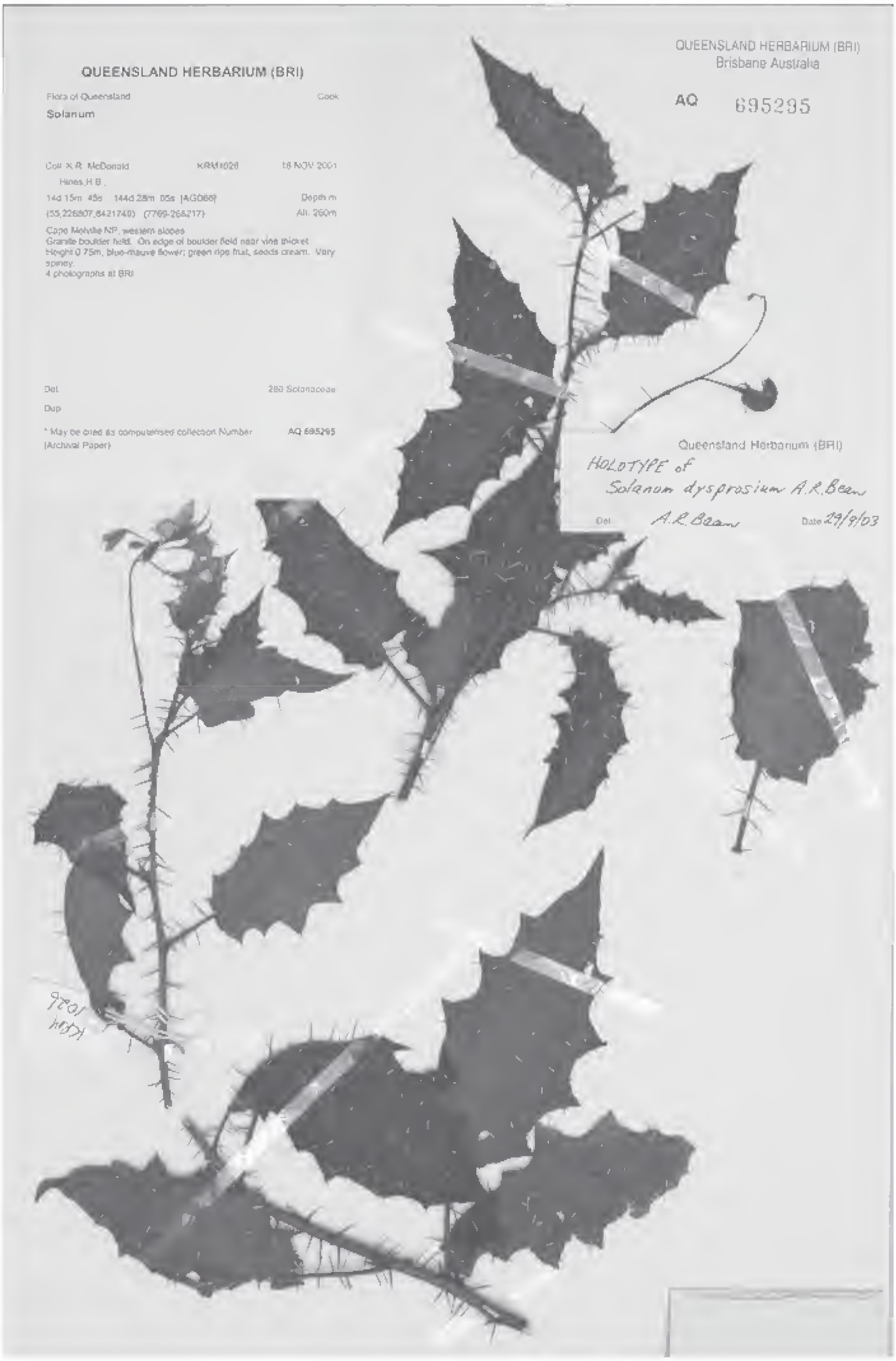

QUEENSLAND HERBARIUM (BRI)
Flora of Queensland
Cook
Solanum
Coll K.R. McDonald
KRM1026
18 NOV 2001
Hines,H.B.
14d 15m 45s 144d 28m 05s [AGD66]
Depth m
(55,226807,8421740) (7769-264217)
Alt. 260m
Cape Melville NP, western slopes
Granite boulder field. On edge of boulder field near vine thicket
Height 0.75m, blue-mauve flower; green ripe fruit, seeds cream. Very spiney.
4 photographs at BRI
Det.
280 Solanaceae
Dup
* May be cited as computerised collection Number
(Archival Paper)
AQ 695295
QUEENSLAND HERBARIUM (BRI)
Brisbane Australia
AQ 695295
Queensland Herbarium (BRI)
HOLOTYPE of
Solanum dysprosium A.R.Bean
Det A.R.Bean
Date 29/9/03
KRM 1026

Fig. 23. Holotype of ***Solanum dysprosium***.

4–8, porrect; central ray absent or present, 0–4 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs sparse. *Adult leaves* ovate, shallowly lobed throughout; lobes 4 or 5 on each side, acute, lobing index 1.3–1.6; lamina 7–10.5 cm long, 3.5–5 cm wide, 1.9–2.2 times longer than broad, apex acute or acuminate, base obtuse, oblique part 0–5 mm long, obliqueness index 0–6 percent; petioles 1.3–3.5 cm long, 20–35% length of lamina, prickles present. *Upper leaf surface* green; prickles 30–50, straight, acicular, 2–8 mm long, prickles present on midvein and lateral veins; stellate hairs distributed throughout; protostellae present; ordinary stellae sparse, 0.5–0.8 mm apart, 0.25–0.5 mm across, sessile; lateral rays 4 or 5, porrect; central ray 0.5–3 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Lower leaf surface* green; prickles 11–17, straight, acicular, present on midvein and lateral veins; stellae moderate, 0.4–0.8 mm apart, 0.5–0.8 mm diameter, sessile; lateral rays 4–6, porrect; central ray 0–1 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Inflorescence* supra-axillary, pseudo-racemose, common peduncle 17–35 mm long, rachis prickles present; 12–15-flowered, flowers 5-merous; pedicels 8–11 mm long at anthesis, same thickness throughout, 0.3–0.6 mm thick at mid-point, prickles absent. Calyx tube 2–2.5 mm long, lobes attenuate, 2–3.5 mm long; prickles absent at anthesis; stellae sparse, transparent, 0.15–0.2 mm across, sessile, lateral rays 4 or 5, central ray 1–2 times as long as laterals, not gland-tipped; finger hairs abundant; Type 2 hairs absent. Corolla purple, 10–14 mm long, shallowly or deeply lobed; anthers 5–5.8 mm long; functional style erect, glabrous. *Fruiting calyx* with lobes less than half length of mature fruit, prickles absent. Mature fruits 1 per inflorescence, globular, *c.* 7 mm diameter; pedicels *c.* 15 mm long in fruit, *c.* 0.7 mm thick at mid-point; seeds pale yellow, 2.5–3 mm long. **Fig. 23.**

***Specimen examined*: Queensland.** Cook District: Cape Melville N.P., western slopes, Nov. 2001, *McDonald* 1026 & *Hines* (BRI).

***Distribution and habitat*:** *Solanum dysprosium* is endemic to Queensland. Confined to Cape Melville on Cape York Peninsula (**Map 9**), it grows on the edge of a granite boulder-field, adjacent to vine thicket.

***Notes*:** Closely related to *S. inaequilaterum*, but differing by the smaller leaves, petioles 20–35% of lamina length, and bearing prickles (petioles 10–22%, without prickles for *S. inaequilaterum*), stellae on lower leaf surface 0.5–0.8 mm diameter (0.3–0.5 mm diameter for *S. inaequilaterum*), common peduncle present (absent for *S. inaequilaterum*), calyx lobes 2–3.5 mm long (4–9 mm for *S. inaequilaterum*).

***Conservation status*:** Data deficient.

***Etymology*:** from the Greek *dysprositos*, meaning hard to get at. This is a reference to the difficulty in accessing the Cape Melville area, where the species is endemic.

26. Solanum inaequilaterum Domin, Biblioth. Bot. 89: 581-582 (1929). **Type:** Queensland. Moreton District: Beechmont, March 1910, *K. Domin s.n.* (holo: ?PR), *n.v.*

***Illustration*:** Symon (1981: 244)

Erect, rhizomatous perennial shrub, 1–3.5 m high. Juvenile branchlets with 120–400 prickles per dm, 1.5–6 mm long; leaves (in outline) elliptical or ovate, deeply lobed, with 2–4 pairs of lobes; lamina 16–24 cm long, 9–14 cm wide, with 100–150 prickles on upper surface. Adult branchlets mauve or brown; prickles 5–55 per decimetre, straight, acicular, 2–9 mm long, 10–14 times longer than wide; stellae sparse, 0.4–0.5 mm diameter, stalks 0–0.1 mm long; lateral rays 4–8, porrect; central ray absent or present, 0–0.5 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Adult leaves* ovate, shallowly lobed throughout; lobes 3–5 on each side, acute, lobing index 1.1–1.8; lamina 9.5–19 cm long, 3.5–7.5 cm wide, 2.3–2.7 times longer than broad, apex acute or acuminate, base cuneate or obtuse, oblique part 0–18 mm long, obliqueness index 0–9 percent; petioles 1.1–2.2 cm long, 10–22% length of lamina, prickles absent. *Upper leaf surface* green; prickles 8–40, straight, acicular, 3–11 mm long, prickles present on midvein and lateral veins; stellate hairs distributed throughout; protostellae present; ordinary stellae very sparse to sparse, 0.8–1.4 mm apart, 0.4–0.5 mm across, sessile; lateral rays 4–8, porrect; central ray 0.5–1.5 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Lower* *leaf surface* green; prickles 0–9, straight, acicular, absent or present on midvein only or present on midvein and lateral veins; stellae sparse to moderate, 0.5–1.3 mm apart, 0.3–0.5 mm diameter, sessile; lateral rays 4–8, porrect; central ray 0.3–1 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Inflorescence* supra-axillary, pseudo-racemose, common peduncle absent, rachis prickles absent; 4–13-flowered, weakly andromonoecious, flowers 5-merous; pedicels 7–24 mm long at anthesis, same thickness throughout or markedly thicker distally, 0.5–1 mm thick at mid-point, prickles absent. Calyx tube 1–3 mm long, lobes attenuate, 4–9 mm long; prickles absent at anthesis; stellae sparse to moderate, yellow, 0.15–0.25 mm across, sessile, lateral rays 5–8, central ray 0.5–1.5 times as long as laterals, not gland-tipped; finger hairs present; Type 2 hairs absent. Corolla white or purple, 8–15 mm long, shallowly or deeply lobed, inner surface glabrous; anthers 4.5–6 mm long; ovary with Type 2 hairs only; functional style 7.5–8.5 mm long, erect, glabrous or with Type 2 hairs only. *Fruiting calyx* with lobes less than half length of mature fruit, prickles absent. Mature fruits 1–4 per inflorescence, globular or ellipsoidal, 11–13 mm diameter, red, 1-locular (septum absent or incomplete); placenta not apparent; mesocarp juicy, succulent; exocarp 0.4–0.5 mm thick; pedicels 26–38 mm long in fruit, 0.6–2 mm thick at mid-point; seeds pale yellow, 2.6–3.4 mm long. *Gin's Whiskers.*

***Specimens examined*:** **Queensland.** MORETON DISTRICT: Roberts Plateau, Lamington N.P., May 1929, *White* 6074 (BRI); Levers Plateau, Apr 1972, *Henderson* H1286 (BRI); beside track at Mt Nothofagus, Sep 1973, *Lander* 336 (BRI, NSW); 0.5 km along Duck Creek road, near O'Reilly Guest House, Dec 1999, *Bean* 15896 (AD, BRI, MEL, NSW); near Best of All Lookout, Springbrook, Mar 2000, *Forster* PIF25385 & *Booth* (A, BRI, MEL, QRS). **New South Wales.** NORTH COAST: Coopers Creek, via Mullumbimby, Aug 1936, *White* 10456 (BRI); Victoria Park, 5 miles [8 km] S of Alstonville, Feb 1971, *O'Hara & Coveny* 3491 (BRI, NSW); summit of Mt Nardi, NE of Nimbin, Feb 2000, *Bean* 16021 (BRI, NSW); Big Scrub Flora Reserve, *c.* 20 km N of Lismore, Dec 2000, *Bean* 17073 (BRI); off Dingo Flat road, Clouds Creek S.F., N of Dorrigo, Jan 2001, *Bean* 17264 (BRI, NSW).

***Distribution and habitat*:** *Solanum inaequilaterum* extends from Springbrook and Lamington National Park in Queensland, to Dorrigo in N.S.W. (**Map 11**). It grows in notophyll rainforest in high rainfall areas. Altitude is often above 750 metres. It is one of the few species that will flower and fruit under very low-light conditions.

***Phenology*:** Flowers are recorded from November to April; fruits may be found throughout the year.

***Notes*:** Closely related to *S. dysprosium* (see Notes under that species). Less closely related to *S. semiarmatum*, with which it shares the deeply lobed juvenile leaves, dense prickles on stems of juvenile plants, and the succulent 1-locular fruit.

In 1920, Georg Bitter made the combination *Lycianthes inaequilatera* (Rusby) Bitter for a Bolivian species, based on *Bassovia inaequilatera* Rusby in Mem. Torrey Bot. Club 6: 90 (1896). He included the notation "*Solanum inaequilaterum* Rusby in sched.", but that combination was never actually published. Since *S. inaequilaterum* Rusby is a *nomen nudum*, it follows that *S. inaequilaterum* Domin is a legitimate name.

The type of *S. inaequilaterum* was sought from PR, but not received. Symon (1981) stated that he had not seen the type. It is possible that the type is missing, but the designation of a neotype is not warranted until further searches are made. The application of the name is not in doubt, as the species is well described in the protologue.

***Conservation status*:** Not considered at risk.

Group 13A (S. semiarmatum group), here defined; related to Group 13 (*S. ferocissimum* group) of Whalen (1984).

Mature fruits globular, black, juicy, 1-locular, <12 mm diameter, exocarp <0.5 mm thick (100%); Type 2 hairs present on branchlets (100%); inflorescences with flowers all bisexual (100%); branchlet prickles abundant (240–1400 per decimetre), acicular (100%); mixture of unbranched and branched inflorescences (100%); corolla inner surface glabrous (100%); fruiting calyx less than half length of mature fruit (100%); adult leaves deeply or shallowly lobed (83%).

3 species endemic to Australia; 3 species in Queensland.

27. Solanum coracinum Symon, Austrobaileya 4: 429–30 (1995). **Type:** Queensland. Darling Downs District: *c.* 22 km east of Yuleba, on road to Miles, 17 November 1975, *R.J. Henderson* 2381 (holo: BRI; iso: AD).

Solanum sp. 3 in Ross (1986)

***Illustration*:** Symon (1995: 430)

Erect, rhizomatous perennial shrub, 0.7–1.5 m high. Juvenile stage unknown. Adult branchlets green; prickles 350–800 per decimetre, straight, acicular, 1–10 mm long, 14–18 times longer than wide; stellae absent or sparse, 0.3–0.5 mm diameter, sessile; lateral rays 4–6, porrect; central ray 0.4–0.8 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs sparse. *Adult leaves* broadly ovate or orbicular, deeply lobed throughout; lobes 3–5 on each side, acute, lobing index 2–25; lamina 5–11.5 cm long, 3.5–10 cm wide, 1.1–1.5 times longer than broad, apex acute, base obtuse or cordate, oblique part 0–7 mm long, obliqueness index 0–9 percent; petioles 2–3.4 cm long, 25–35% length of lamina, prickles absent. *Upper leaf surface* green; prickles 15–100, straight, acicular, 1–10 mm long, prickles present on midvein and lateral veins; stellate hairs confined to midrib, or distributed throughout; protostellae absent; ordinary stellae very sparse, 0.9–7.5 mm apart, 0.3–0.45 mm across, sessile; lateral rays 4–8, porrect; central ray 0.4–0.8 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Lower leaf surface* green; prickles 10–30, straight, acicular, present on midvein and lateral veins; stellae absent or very sparse, 0.8–3.2 mm apart, 0.45–0.6 mm diameter, stalks 0–0.1 mm long; lateral rays 6–8, porrect; central ray 0.4–0.8 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Inflorescence* supra-axillary, pseudo-racemose or 2-branched, common peduncle 18–39 mm long, rachis prickles present; 14–30-flowered, with all flowers bisexual and 5-merous; pedicels 4–8 mm long at anthesis, same thickness throughout, 0.3–0.4 mm thick at mid-point, prickles absent. Calyx tube 1.5–2.5 mm long, lobes deltate or rostrate, 1.5–3 mm long; prickles absent at anthesis; stellae moderate, transparent, 0.25–0.4 mm across, sessile, lateral rays 6–8, central ray 0.7–1.3 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs present. Corolla purple, 7–9 mm long, deeply lobed, inner surface glabrous; anthers 4–5.5 mm long; ovary with Type 2 hairs only, or with stellate and Type 2 hairs; functional style 4.5–6.5 mm long, erect, with Type 2 hairs only. *Fruiting calyx* with lobes less than half length of mature fruit, prickles absent. Mature fruits 3–9 per inflorescence, globular, 6–9 mm diameter, black, 1-locular (septum absent or incomplete); placenta not apparent; mesocarp juicy, succulent; exocarp 0.15–0.3 mm thick; pedicels 4–10 mm long in fruit, 0.5–0.8 mm thick at mid-point; seeds pale yellow, brown or black, 2.1–2.8 mm long.

***Specimens examined*:** **Queensland.** Leichhardt District: 19 km W of Wandoan, Aug 1999, *Cook s.n.* (BRI). Darling Downs District: 'Palardo', May 1934, *Blake* 5866 (BRI); 10 miles [16 km] E of Texas, Jun 1951, *Everist* 2539 & *Webb* (BRI); 'Shellbourne', *c.* 20 miles [32 km] NE of Miles, May 1960, *Johnson* 1630 (BRI); E of Combididan Farm, 'Cypress Downs', Sep 1961, *Jones* 164 (BRI); 'Benandre', 23 miles [37 km] SE of Texas, Apr 1962, *Pedley* 988 (BRI); 20 km W of Milmerran, Feb 1984, *Stower* (BRI); Houston–Gillespie Dam road, N of Grays Gate, Dec 1999, *Menkins* DDP8 (BRI); 2.6 km E of Arcot, ENE of Texas, May 2000, *Bean* 16657 (BRI, NSW); Road 105, 7 km S of Milmerran, May 2003, *Bean* 20305 (BRI); Road 59, SE of Milmerran, May 2003, *Bean* 20333 (BRI);

***Distribution and habitat*:** *Solanum coracinum* is endemic to Queensland, extending from Wandoan to Texas (**Map 10**), but not yet recorded for New South Wales. It inhabits open forest dominated by brigalow or belah, or shrubby eucalypt woodland with *Callitris*. Soils may be sandy-loams to clays.

***Phenology*:** Flowers are recorded from February to May and from August to December; mature fruits recorded from April, May, June and December.

***Notes*:** *S. coracinum* is closely related to *S. mitchellianum*, differing by the glabrous to sparsely pubescent branchlets and leaf undersides, the deeply lobed leaves with more prickles on the upper surface, and the stellae of the lower leaf surface with a shorter central ray. Three specimens (*Bean* 17776, Thomby Range; *Beasley s.n.*, Chinchilla; and *Fensham* 2877, NNW of Miles) appear to represent intergrades between it and *S. mitchellianum*. *S. mitchellianum* occurs to the east, west and north of the geographical range of *S. coracinum.*

***Conservation status*:** *S. coracinum* is known from seven localities, none of which is within a conservation reserve. Applying the IUCN guidelines (IUCN. 2001), a category of “Vulnerable” is recommended (VU A4ce; B1ab(iii)+2ab(iii)).

28. Solanum mitchellianum Domin, Repert. Spec. Nov. Regni Veg. 12: 131 (1913). **Type:** Subtropical New Holland, *anno* 1846, *T. Mitchell* (lecto: K; isolecto: BM, L), *fide* Symon (1981).

Illustration: Symon (1981: 127), as *S. semiarmatum.*

Erect, rhizomatous perennial shrub, 0.5–1.8 m high. Juvenile branchlets with 240–1400 prickles per dm; leaves (in outline) ovate, deeply lobed, with 3 or 4 pairs of lobes; lamina *c.* 11.5 × 8 cm, with *c.* 40 prickles on upper surface. Adult branchlets terete or ridged, green; prickles 240–1400 per decimetre, straight, acicular, 1–10 mm long, 14–20 times longer than wide; stellae dense, 0.4–0.7 mm diameter, stalks 0–0.15 mm long; lateral rays 6–8, porrect; central ray 0.5–1 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs sparse. *Adult leaves* ovate, entire or shallowly lobed throughout; lobes 3 or 4 on each side, acute or obtuse, lobing index 1–1.9; lamina 5.5–10.5 cm long, 1.8–6.5 cm wide, 1.5–3 times longer than broad, apex acute, base obtuse or cordate, oblique part 0–3.5 mm long, obliqueness index 0–5 percent; petioles 1.1–2.8 cm long, 18–30% length of lamina, prickles present. *Upper leaf surface* green; prickles 8–20, straight, acicular, 1–8 mm long, prickles present on midvein and lateral veins; stellate hairs distributed throughout; protostellae absent; ordinary stellae very sparse to moderate density, 1–3 mm apart, 0.25–0.7 mm across, stalks 0–0.1 mm long; lateral rays 4–8, porrect; central ray 0.8–1.5 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs present only in vein depressions. *Lower leaf surface* white; prickles 2–10, straight, acicular, present on midvein only or present on midvein and lateral veins; stellae very dense, *c.* 0.05 mm apart, 0.5–0.8 mm diameter, stalks 0–0.3 mm long; lateral rays 7–9, porrect; central ray 1–1.5 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Inflorescence* supra-axillary, pseudo-racemose or 2–3-branched, common peduncle 21–40 mm long, rachis prickles present; 7–25-flowered, with all flowers bisexual and 5-merous; pedicels 3–6 mm long at anthesis, same thickness throughout or markedly thicker distally, 0.3–0.6 mm thick at mid-point, prickles absent or present. Calyx tube 0.5–1.5 mm long, lobes hemispherical, deltate or attenuate, 2–3.5 mm long; prickles absent at anthesis; stellae moderate to dense, transparent, 0.25–0.5 mm across, sessile, lateral rays 5–8, central ray 0.8–1.2 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. Corolla purple, 7–10 mm long, deeply lobed, inner surface glabrous; anthers 3.5–5.5 mm long; ovary glabrous or with stellate hairs only; functional style 6.5–8.5 mm long, erect, glabrous or with stellate hairs only, stellae *c.* 0.4 mm across, lateral rays *c.* 8, central ray *c.* 1 times as long as laterals. *Fruiting calyx* with lobes less than half length of mature fruit, prickles absent. Mature fruits 7–17 per inflorescence, globular, 8–9 mm diameter, black, 1-locular (septum absent or incomplete); placenta not apparent; mesocarp juicy, succulent; exocarp 0.1–0.2 mm thick; pedicels 8–10 mm long in fruit, 0.8–0.9 mm thick at mid-point; seeds brown to black, 1.8–2.4 mm long.

***Selected specimens examined*:** **Queensland.** Leichhardt District: Moolyamba Gorge, Carnarvon Ranges, Sep 1940, *White* 11361 (BRI); ‘Rosedale’ near Baralaba, Sep 1959, *Johnson* 917 (BRI); Pegunny North, *c.* 55 km W of Moura, May 1962, *Johnson* 2289 (BRI); Injune–Rolleston road, *c.* 77 km from Injune, Sep 1974, *Moriarty* 1558 (BRI, CANB); Little St Peter, 10 miles [16 km] N of Springsure, Sep 1985, *O’Keeffe* 783 (BRI); Nathan Gorge, SW of Cracow, Aug 1990, *Forster* PIF7188 (BRI, MEL); Bunbuncundoo Spring, Ka Ka Mundi N.P., Sep 1993, *Purdie* 4339 (BRI, CANB); Auburn Range S.F., Jun 1996, *Bean* 10338 (BRI, MEL, NSW); 14.8 km along Arcturus Road, NE of Springsure, Oct 1998, *Bean* 14009 (BRI); Expedition N.P., Amphitheatre section, Nov 1998, *Forster* PIF23862 & *Booth* (AD, BRI, K, MEL, NSW, QRS); Zamia Creek, Palmgrove N.P., Sep 2000, *Forster* PIF26109 *et al.* (AD, BRI, MEL); Brigalow Research Station, SW of Moura, Dec 2001, *Bean* 18256 (BRI, MEL). Port Curtis District: Callide Valley, Apr 1937, *White* 11184 (BRI). Warrego District: ‘Carnarvon’ Station, Mar 2001, *Fensham* 4225 (BRI). Maranoa District: Kenniff Lookout, *c.* 80 km SW of Rolleston, Jun 1977, *Crisp* 3084 (AD, BRI, CANB); ‘Stanhope Downs’, *c.* 44 km by road NW of Roma on Orallo Road, Dec 1997, *Thomas* 1267 (BRI). Burnett District: Dingo Trap track, ‘Narayen’, Dec 1973, *Leach* N1496 (BRI); Monogorilby, Mundubbera shire, Jan 1982, *Forster* 1105 (BRI). Darling Downs District: Chinchilla, Jul 1912, *Beasley* 3 (BRI); ‘Wyaga’, Goondiwindi district, Sep 1919, *White s.n.* (BRI); Cooranga North, Apr 1925, *White* 2490 (BRI); ‘Calala’, *c.* 10 miles [16 km] E of Meandarra, Apr 1960, *Johnson* 1620 (BRI); 2.5 km SSW of Gladfield, Jun 1986, *Forster* PIF2474 *et al.* (BRI). **New South Wales.** North West Slopes: 7 miles [11 km] from Crooble on Warialda road, Sep 1950, *Roe* 258 (CANB); 7.5 km NW of North Star, Sep 1988, *Moore* 8689

(BRI, CANB); 'Warivan', 7.4 km from North Star on road to Warialda, Sep 1988, *Moore* 8835 (CANB).

***Distribution and habitat*:** *Solanum mitchellianum* extends from Springsure and Blackwater in Queensland to Warialda in New South Wales (**Map 12**). It inhabits semi-evergreen vine thickets, brigalow-belah communities or shrubby eucalypt woodlands often with rock outcrops.

***Phenology*:** Flowers are recorded for all months of the year; mature fruits are recorded between September and April.

***Notes*:** Closely related to *S. semiarmatum*, and for many years included in synonymy with it. *S. mitchellianum* is however amply different by virtue of the shallowly lobed or entire adult leaves, stellae on the lower leaf surface sessile or with stalks <0.3 mm long, ovary glabrous or with stellae only (with Type 2 hairs only for *S. semiarmatum*), styles glabrous or with stellae (with Type 2 hairs only for *S. semiarmatum*), and calyx prickles absent (present for *S. semiarmatum*). It is also close to *S. coracinum* (see notes under that species).

***Conservation status*:** Widespread. Not considered at risk.

29. Solanum semiarmatum F.Muell., Fragm. 2: 163 (1861). **Type:** New South Wales. North Coast: Clarence River, undated, *H. Beckler* (holo: MEL [MEL12130]; iso: K, NSW).

***Illustration*:** Symon (1981: 126)

Erect, rhizomatous perennial shrub, 1.5–3 m high. Juvenile branchlets with 600–1400 prickles per dm, 0.5–7 mm long; leaves (in outline) ovate, deeply lobed, with 4 or 5 pairs of lobes; lamina *c.* 16 × 10 cm, with *c.* 70 prickles on upper surface. Adult branchlets green; prickles 600–1400 per decimetre, straight, acicular, 1–13 mm long, 15–20 times longer than wide; stellae sparse to dense, 0.5–0.8 mm diameter, stalks 0–1.5 mm long; lateral rays 4–8, porrect; central ray 0.5–1.5 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs sparse. *Adult leaves* ovate or broadly ovate, deeply lobed throughout; lobes 3 or 4 on each side, acute or obtuse, lobing index 2–7; lamina 7–17 cm long, 3.5–10 cm wide, 1.5–1.9 times longer than broad, apex acute, base obtuse or cordate, oblique part 1.5–8 mm long, obliqueness index 2–7 percent; petioles 1.7–4.5 cm long, 20–40% length of lamina, prickles present. *Upper leaf surface* green; prickles 7–70, straight, acicular, 1–10 mm long, prickles present on midvein and lateral veins; stellate hairs distributed throughout; protostellae present; ordinary stellae sparse or moderate density, 0.4–0.8 mm apart, 0.15–0.4 mm across, sessile; lateral rays 4–6, ascending; central ray 0.7–1.2 times as long as laterals, not gland-tipped; finger hairs present, 0.1–0.8 mm apart, not gland-tipped, 0.1–0.15 mm long; Type 2 hairs absent. *Lower leaf surface* white or yellowish; prickles 35–200, straight, acicular, present on midvein and lateral veins; stellae dense to very dense, 0.05–0.1 mm apart, 0.5–0.8 mm diameter, stalks 0–2.5 mm long; lateral rays 6–8, porrect; central ray 1–2 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Inflorescence* supra-axillary, pseudo-racemose or 2-branched or 3-branched, common peduncle 7–30 mm long, rachis prickles present; 10–30-flowered, with all flowers bisexual and 5-merous; pedicels 3–10 mm long at anthesis, same thickness throughout, 0.5–0.7 mm thick at mid-point, prickles present. Calyx tube 1–2 mm long, lobes deltate or attenuate, 1–3 mm long; prickles absent or present at anthesis, 0–25 per flower, 0.5–2 mm long; stellae dense, transparent, 0.6–0.8 mm across, stalks 0–1.2 mm long, lateral rays 5–7, central ray 1–1.7 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs present. Corolla purple, 10–12 mm long, deeply lobed, inner surface glabrous; anthers 3.5–5.5 mm long; ovary with Type 2 hairs only; functional style 7–9 mm long, erect, with Type 2 hairs only. *Fruiting calyx* with lobes less than half length of mature fruit, prickles 0.5–3 mm long. Mature fruits 4–9 per inflorescence, globular, 10–12 mm diameter, black, 1-locular (septum absent or incomplete); placenta not apparent; mesocarp juicy, succulent; exocarp 0.1–0.2 mm thick; pedicels 8–14 mm long in fruit, 1.2–1.4 mm thick at mid-point; seeds pale yellow, 2–2.8 mm long. *Gin's Whiskers.*

Selected specimens examined: **Queensland.** Darling Downs District: Wilsons Peak, May 1933, *Michael s.n.* (BRI); 6 km from Mt Colliery towards Gambubal S.F., E of Warwick, Apr 1999, *Bean* 14802 (BRI, MEL); Killarney–The Head road, 7.1 km NE of Queen Mary Falls, Jan 2002, *Bean* 18332 (BRI, MEL, NSW). Moreton District: Mt Mistake, Jun 1887, *Simmonds* (BRI); Mt Lindesay, Oct 1921, *White s.n.* (BRI); Beech Mountain, Apr 1923, *White* 1927 (BRI); Roberts Plateau, Lamington N.P., May 1929, *White* 6072 (BRI); Levers Plateau, *c.* 90 km SSW of Brisbane, Apr 1972, *Henderson* H1298 (BRI); 3.3 km along Duck Creek Road, near O'Reilly's Guest House, Mar 2001, *Bean* 17388 (BRI). **New South Wales.** North Coast: Toonumbar S.F., *c.* 26 km NW of Kyogle, Feb 1972, *Henderson* H1260A & *Parham* (BRI); lower slopes of Mt Lindesay, 7 miles [11 km] ENE of Woodenbong, Sep 1972, *Coveny* 4544 & *Rodd* (BRI, NSW); Old Grevillea–Bundgeam road, 25 km NW of Kyogle, Dec 1977, *Haegi* 1538 (BRI, NSW).

***Distribution and habitat*:** *Solanum semiarmatum* is found along the "scenic rim" of south-eastern Queensland, from Lamington N.P. to Mt Mistake, and adjacent areas of New South Wales south to Kyogle (**Map 10**). It inhabits open areas within or on the margins of tall notophyll rainforest, at altitudes generally above 800 metres.

***Phenology*:** Flowers are recorded from September to May; mature fruits are recorded from January to May.

***Notes*:** Closely related to *S. mitchellianum* (see notes under that species).

***Conservation status*:** Not considered at risk.

Group 14 (**S. torvum group**) of Whalen (1984)

Large shrubs; prickles broad-based, sparse on large stems and branchlets (100%); adult leaves entire or shallowly lobed, broadly ovate, 7.5–26 cm long; upper leaf surface without prickles, protostellae present (100%); inflorescence 2–many branched, with 15–65 flowers (100%); calyx prickles absent (100%); corolla deeply lobed, white (100%); ovary with Type 2 hairs only (100%); mature fruits yellowish-green (100%).

About 50 species, mainly in montane areas of the neotropics, but with a few species in Malesia; 2 species naturalised in Queensland.

30. *Solanum chrysotrichum Schltdl., Linnaea 19: 304 (1847). **Type:** near Las Trojes, Mexico, 1825–31, *C.J.W. Schiede* 81 (holo: HAL, *fide* Welman (2003)), *n.v.*

[*S. hispidum auct. non* Persoon]

***Illustrations*:** Symon (1981: 114), as *S. hispidum;* Welman (2003: 6).

Erect, rhizomatous perennial shrub, 1.5–4 m high. Juvenile branchlets with *c.* 15 prickles per dm, 3–6 mm long; leaves (in outline) broadly ovate, shallowly to deeply lobed, with 5 or 6 pairs of lobes; lamina 23–41 cm long, 16–40 cm wide, with 10–30 prickles on upper surface. Adult branchlets brown; prickles 0–20 per decimetre, curved, broad-based, 1–4 mm long, 2–3 times longer than wide; stellae sparse to dense, 0.5–0.6 mm diameter, stalks 0.1–1 mm long; lateral rays 6–8, porrect; central ray absent or present, 0–0.4 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Adult leaves* broadly ovate, shallowly lobed throughout; lobes 3–5 on each side, acute or obtuse, lobing index 1.2–2.1; lamina 12–26 cm long, 9–19 cm wide, 1.3–1.9 times longer than broad, apex acute or acuminate, base cuneate, obtuse or cordate, oblique part 0–12 mm long, obliqueness index 0–5 percent; petioles 2–6.3 cm long, 11–25% length of lamina, prickles absent or present. *Upper leaf surface* green; prickles absent; stellate hairs distributed throughout; protostellae present; ordinary stellae sparse, 0.3–0.6 mm apart, 0.2–0.6 mm across, sessile; lateral rays 5–8, porrect; central ray 0.2–2 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Lower leaf surface* green or yellowish; prickles 0–3, straight or curved, broad-based, prickles absent or present on midvein only; stellae moderate to dense, 0.3–0.5 mm apart, 0.4–0.6 mm diameter, stalks 0–0.3 mm long; lateral rays 6–8, porrect; central ray 0.1–0.7 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Inflorescence* leaf-opposed or supra-axillary, 3 or 4-branched, common peduncle 6–18 mm long, rachis prickles absent; 13–65-flowered, weakly andromonoecious, flowers 5-merous; pedicels 3–13 mm long at anthesis, markedly thicker distally, 0.7–0.9 mm thick at mid-point, prickles absent. Calyx tube 2–4 mm long, lobes rostrate or attenuate, 4.5–10 mm long; prickles absent at anthesis; stellae dense to very dense, brown or rusty, 0.3–0.9 mm across, stalks 0–1 mm long, lateral rays 7–9, central ray 0.2–1 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. Corolla white, 14–20 mm long, deeply lobed, inner surface sparsely stellate-hairy; anthers 6–9 mm long; ovary with Type 2 hairs only; functional style 10–13.5 mm long, erect, with Type 2 hairs only. *Fruiting calyx* with lobes less than or more than half length of mature fruit, prickles absent. Mature fruits 7–37 per inflorescence, globular, 14–17 mm diameter, yellowish-green, 2–3-locular; placenta in cross-section stalked, anvil-shaped; mesocarp moist but not juicy; exocarp 0.5–0.8 mm thick; pedicels 11–21 mm long in fruit, 1.4–1.8 mm thick at mid-point; seeds pale yellow, 2.5–2.7 mm long. *Giant Devil's Fig.*

***Specimens examined*:** **Queensland.** BURNETT DISTRICT: Tarong Power station site, 15 km S of Nanango, Nov 1996, *Skillington s.n.* (BRI). WIDE BAY DISTRICT: Conondale Range, S.F.274, Oct 1982, *McDonald* 3626 & *Williams* (BRI); Currymore, NW of Maleny, Apr 1993, *Bean* 6014 (BRI). MORETON DISTRICT: Wooloowin-Windsor etc. (Brisbane), May 1917, *White s.n.* (BRI); Ferny Grove near Brisbane, Nov 1934, *White s.n.* (BRI); Joseph Cresent, Deception Bay, Sep 1980, *Dillewaard* 61 & *Olsen* (BRI); Samford, Sep 1984, *Bunch* JT1114 (BRI); Big Tree L.A., S.F.832, SE of Bellthorpe, Jun 1993, *Bean* 6120 (BRI); corner of Alex Rd & Attunga Lane, Mt Glorious, Oct 1997, *Phillips* 70 (AD, BRI); South Stradbroke Island, Jul 1998, *Leiper s.n.* (BRI); Gold Creek road, Brookfield, W of Brisbane GPO, Feb 2000, *Bean* 16034 (BRI, NSW, NY); Brisbane River, Long Pocket, Indooroopilly, Sep 2000, *Batianoff* 200905 (BRI, DNA, NSW); Industry Drive, Caboolture, Apr 2001, *Bean* 17617 (BRI, MEL, PRE). **New South Wales.** NORTH COAST: Tuntable Creek road, ESE of Nimbin, Sep 1994, *Bean* 7933 (BRI, NSW). **Mexico:** 15 km W of Santa Rosa, Verz Cruz, Oct 1930, *Reddick* 616 (BH); San Andres, NW of San Cristobal, Feb 1931, *Souviron & Erlanson* 76 (BH); top of ridge between La Cumbre and Las Joyas, Jan 1979, *Nee & Iltis* 16695 (BH, NY); along highway Mex. 190, 10 km SW of Motozintla, Dec 1985, *Nee* 32331 (BH, NY).

***Distribution and habitat*:** *Solanum chrysotrichum* is indigenous to southern Mexico, Guatemala, Costa Rica and Panama, and naturalised in many subtropical parts of the world. It is naturalised in south-eastern Queensland, and extreme north-eastern N.S.W. (**Map 13**). It inhabits degraded places in association with a range of other weedy species.

***Notes*:** This species has been erroneously called *S. hispidum* Pers. for many years, but true *S. hispidum* is from the Peruvian Andes, and has not been reported as a naturalised plant. Identification of Queensland material was achieved by matching with Mexican specimens identified by neotropical *Solanum* experts, M. Whalen and M. Nee.

***Phenology*:** Flowers and fruits may be found at any time of the year.

31. *Solanum torvum Sw., Prodr. 47 (1788). **Type:** Jamaica, undated, *O. Swartz s.n.* (holo: S), *n.v., fide* D'Arcy (1974: 860).

Solanum largiflorum C.T.White, Queensland Agric. J. 8: 170 (1917). **Type:** Queensland. WIDE BAY DISTRICT: Kin Kin, March 1916, *C.T. White & W.D. Francis* (syn: MEL, NSW), photos at BRI.

***Illustrations*:** Symon (1981: 115); Welman (2003: 4).

Erect, rhizomatous perennial shrub, 0.8–2.5 m high. Juvenile branchlets with 5–15 prickles per dm, 2–5 mm long; leaves (in outline) broadly ovate, deeply lobed, with 2–4 pairs of lobes; lamina 12–18 cm long, 9–15 cm wide, with 0–9 prickles on upper surface. Adult branchlets brown or green; prickles absent or present, 0–5 per decimetre, straight or curved, broad-based, 3–7 mm long, 1.5–2 times longer than wide; stellae dense, 0.6–1 mm diameter, stalks 0.1–0.4 mm long; lateral rays 6–9, porrect; central ray 0.1–0.3 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Adult leaves* broadly ovate or orbicular, entire or shallowly lobed throughout; lobes 1–3 on each side, acute or obtuse, lobing index 1–1.3; lamina 7.5–16.5 cm long, 4–13 cm wide, 1.1–1.5 times longer than broad, apex acute, base obtuse or cordate, oblique part 0–4 mm long, obliqueness index 0–5 percent; petioles 0.9–4.3 cm long, 15–26% length of lamina, prickles absent. *Upper leaf surface* green; prickles absent; stellate hairs distributed throughout; protostellae present; ordinary stellae sparse to dense, 0.25–0.5 mm apart, 0.3–0.5 mm across, sessile; lateral rays 5–8, porrect; central ray 0.8–2 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs present throughout, 0.2–0.5 mm apart. *Lower leaf surface* white; prickles 0–3, straight, broad-based, prickles absent or present on midvein only; stellae dense, 0.1–0.3 mm apart, 0.6–1 mm diameter, stalks 0–0.4 mm long; lateral rays 8–9, porrect; central ray 0.3–0.9 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Inflorescence* supra-axillary, 2–4-branched, common peduncle 2–17 mm long, rachis prickles absent; 15–50-flowered, weakly andromonoecious, flowers 5-merous; pedicels

6–10 mm long at anthesis, same thickness throughout, 0.6–0.8 mm thick at mid-point, prickles absent. Calyx tube 1–1.5 mm long, lobes deltate or rostrate, 1.5–4.5 mm long; prickles absent at anthesis; stellae sparse to moderate, white, 0.2–0.5 mm across, sessile, lateral rays 6–8, central ray 0.8–1.8 times as long as laterals, not gland-tipped or gland-tipped; finger hairs present; Type 2 hairs absent. Corolla white, 9–12 mm long, deeply lobed, inner surface glabrous; anthers 6–7.5 mm long; ovary with Type 2 hairs only; functional style 9–10.5 mm long, erect, glabrous. *Fruiting calyx* with lobes less than half length of mature fruit, prickles absent. Mature fruits 2–15 per inflorescence, globular, 12–17 mm diameter, yellowish-green, 2-locular; placenta in cross-section stalked, anvil-shaped; mesocarp moist but not juicy; exocarp 0.5–0.7 mm thick; pedicels 14–19 mm long in fruit, 1.8–2.4 mm thick at mid-point; seeds white or pale yellow, 2.2–2.4 mm long. *Devil's Fig.* **Fig. 2.**

***Selected specimens examined*: Northern Territory.** Berrimah Farm, Darwin, Feb 1981, *Rankin* 2582 (BRI, CANB, DNA). **Queensland.** BURKE DISTRICT: Leichhardt River, Mt Isa, Nov 1999, *Stevens & Fox* IDF909 (BRI). COOK DISTRICT: Daintree, May 1952, *Everist* 5129 (BRI); Copper Lode Falls Dam area, Cairns, Dec 1972, *Birch* 12 (BRI); Mt Webb near 'Starcke' HS, N of Hope Vale mission, Aug 1978, *Kanis* 1912 (BRI, CANB, L, MO, US); Cooktown rubbish dump, Jul 1991, *Waterhouse* 1881 (BRI, DNA, PERTH); Lakefield N.P., Twelve Mile area, Normanby River, Jan 1993, *Forster* PIF12901 & *Bean* (AD, BRI, QRS). NORTH KENNEDY DISTRICT: Ayr, undated, *Michael* 1533 (BRI); Cromarty, Mar 1935, *Blake* 8317 (BRI); Black River, *c.* 14 miles [23 km] N of Townsville, May 1967, *Symon* 4743 (BRI); *c.* 15 km N of Proserpine, western foot of Mt Dryander, Jul 1974, *Henderson* H2228 *et al.* (BRI); Fletcher Creek, 6 km N of 'Toomba' HS, Nov 1986, *Bolton* MPB740 (BRI). SOUTH KENNEDY DISTRICT: 17 km SE of Kuttabul on Townsville–Mackay Hwy, Sep 1981, *Haegi* 2059 (BRI, NSW); Newry Island, Dec 1986, *Dalliston* N275 (BRI); Bowen River crossing, 24 km S of Collinsville, Jun 1989, *Jobson* 615 (BRI, CANB, NSW). LEICHHARDT DISTRICT: just west of Nebo, Apr 1998, *Holland* 1192 (BRI). PORT CURTIS DISTRICT: Yeppoon, Jul 1974, *Swarbrick* 6190 (BRI); 0.9 km from Bruce Hwy, towards St Lawrence, Apr 2000, *Bean* 16263 (BRI); T.R.202 Colosseum Creek, Apr 2000, *Forster* PIF25478 & *Booth* (AD, BRI, MEL, QRS). WIDE BAY DISTRICT: Theebine, Nov 1921, *White s.n.* (BRI); Noosa N.P., north east corner, Aug 1985, *Sharpe* 3832 *et al.* (BRI, MEL); Ocean Park estate, Dundowran, Nov 1991, *Forster* PIF9177 & *Smyrell* (AD, BRI, MEL). MORETON DISTRICT: Mt Buderim, Jan 1935, *Blake* 7188 & *Middleton* (BRI); Nairn Road, Morayfield, *c.* 35 km N of Brisbane, Mar 2000, *Bean* 16108 (BRI, CANB, MEL, MO, NSW); Godfreys road, Bli Bli, *c.* 1 km N of Maroochy River, Mar 2000, *Bean* 16136 (BRI, DNA, NSW).

***Distribution and habitat*:** *Solanum torvum* is native to the West Indies, but is now naturalised in many tropical parts of the world. It is naturalised along the east coast of Queensland, especially north of the Tropic of Capricorn, and at Mt Isa (**Map 15**). It is recorded from the far north of the Northern Territory, but is not yet known from New South Wales. It grows on degraded sites, including roadsides, pasture and quarries.

***Phenology*:** Flowers and fruits may be found at any time of the year.

***Notes*:** Boonkerd *et al.* (1993) list a number of uses made for *S. torvum* in south-east Asia. For example, young immature fruits are eaten raw or cooked as a vegetable, and the fruits are commonly available in local markets. *S. torvum* is sometimes used as a disease resistant rootstock for Tomato and Eggplant.

Group 22 (**S. quitoense group**) of Whalen (1984)

Mature fruits densely stellate-tomentose, 25–35 mm diameter; stems, branchlets and leaves prickly, calyx not prickly; branchlet stellae with lateral rays ascending or multiradiate; adult leaves large, broadly-ovate to orbicular, shallowly lobed; ovary and style with dense stellate hairs; stellae of upper leaf surface with central ray many times longer than laterals; corolla white; seeds brown to black.

12 species in the world; 1 species in Australia, 1 species indigenous to Queensland.

32. Solanum lasiocarpum Dunal, Hist. Nat. Solanum 222 (1813); *S. ferox* var. *lasiocarpum* (Dunal) Miq., Flora Indiae Batavae 2: 647 (1856). **Type:** t. 35, Hortus Indicus malabaricus Vol. 2 (1680); lecto: the illustration, *fide* Whalen *et al.* (1981).

***Illustration*:** Symon (1981: 107), as *S. ferox.*

Erect, rhizomatous perennial shrub, 1–2 m high. Juvenile stage unknown. Adult branchlets grey or brown; prickles 20–350 per decimetre, straight, acicular or broad-based, 1–4 mm long, 5–10 times longer than wide; stellae dense, 0.8–1.2 mm diameter, stalks 0–0.5 mm long; lateral rays 8–10, ascending or multiradiate; central ray 0.8–1.5 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Adult leaves* broadly ovate or orbicular, shallowly lobed throughout; lobes 3–8 on each side, acute or obtuse, lobing index 1.1–1.3; lamina 10–35 cm long, 8.5–26 cm wide, 1.1–1.3 times longer than broad, apex obtuse or acute, base obtuse or cordate, oblique part 0–15 mm long, obliqueness index 0–4 percent; petioles 2.7–7.2 cm long, 18–30% length of lamina, prickles present. *Upper leaf surface* green; prickles 0–120, straight, acicular or broad-based, 2–7 mm long, prickles absent or present on midvein only or present on midvein and lateral veins; stellate hairs distributed throughout; protostellae present; ordinary stellae density moderate to dense, 0.2–0.4 mm apart, 0.35–0.5 mm across, sessile; lateral rays 4–8, ascending or multiradiate; central ray 4–10 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Lower leaf surface* white or yellowish; prickles 0–60, straight, acicular or broad-based, prickles absent or present on midvein only or present on midvein and lateral veins; stellae dense to very dense, 0.1–0.3 mm apart, 0.5–0.8 mm diameter, stalks 0–0.4 mm long; lateral rays 8–12, ascending or multiradiate; central ray 1–2 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Inflorescence* supra-axillary, pseudo-racemose, common peduncle 0–2 mm long, rachis prickles present; 2–10-flowered, weakly andromonoecious, flowers 5-merous; pedicels 4–9 mm long at anthesis, same thickness throughout, 0.7–1 mm thick at mid-point, prickles absent. Calyx tube 2.5–5 mm long, lobes deltate, 2–8 mm long; prickles absent at anthesis; stellae very dense, yellow or white, 0.5–0.8 mm across, stalks 0–1 mm long, lateral rays 6–12, central ray 1–2 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. Corolla white, 12–18 mm long, deeply lobed, inner surface glabrous or sparsely stellate-hairy; anthers 6–8.5 mm long; ovary with stellate hairs only; functional style erect, glabrous. *Fruiting calyx* with lobes less than half length of mature fruit, prickles absent. Mature fruits 1 or 2 per inflorescence, globular, 25–35 mm diameter, orange, conspicuously tomentose; mesocarp moist but not juicy; pedicels 10–15 mm long in fruit, 0.9–1.5 mm thick at mid-point; seeds brown to black, 2.2–3.5 mm long.

***Specimens examined*: Queensland.** COOK DISTRICT: near Lockerbie, Dec 1980, *Hyland* 10946A (BRI, QRS); 22.4 km NE of Bamaga, Feb 1994, *Fell* DGF4064 & *Stanton* (BRI, MEL, QRS).

***Distribution and habitat*:** *Solanum lasiocarpum* is widespread from India and southern China, and throughout Indochina and Malesia. In Australia, it is known only from the Bamaga area (**Map 8**). It grows in notophyll rainforest.

***Phenology*:** Flowers recorded in February; fruits (maturity unknown) recorded in December.

***Notes*:** A photograph of the iconotype is shown in Whalen *et al.* (1981: 102). Heiser (1996) treated *S. lasiocarpum* as a variety of *S. ferox* L., but the latter differs significantly by the aculeate and accresent calyx.

***Conservation status*:** *S. lasiocarpum* is known only from near Bamaga, and is not protected in a conservation reserve. Its occurrence equates to a single location, using the definition provided by the IUCN (2001). Applying the IUCN guidelines (IUCN. 2001), a category of “Vulnerable” is recommended (VU D1+2).

Group 23 (**S. mammosum group**) of Whalen (1984)

Small prickly shrubs; leaves broad, shallowly lobed; seeds 4.8–5.5 mm long; branchlets and leaves without stellate hairs but with many finger hairs; mature fruits globose, 25–45 mm diameter, orange, with dry mesocarp; corolla deeply lobed; calyx prickly; Type 2 hairs present on branchlets.

About 20 species in the neotropics; 1 species naturalised in Queensland.

33. *Solanum capsicoides All., Mélanges Philos. Math. Soc. Roy. Turin 5: 12 (1773). **Type:** cultivated at Turin, undated, *C. Allioni s.n.* (holo: TO), *n.v.*, *fide* Welman (2003).

Solanum ciliatum Lam., Tab. Encyc. Meth. Bot. 2: 21 (1794). **Type:** locality unknown, undated, coll. unknown (syn: P-LA, microfiche 467.18).

***Illustrations*:** Symon (1981: 102); Welman (2003: 6).

Erect, rhizomatous perennial shrub, 0.3–1 m high. Juvenile branchlets with *c.* 100 prickles per dm; leaves (in outline) broadly ovate, deeply lobed, with 3 pairs of lobes; lamina *c.* 11 × 13 cm, with *c.* 10 prickles on upper surface. Adult branchlets brown or green; prickles 30–80 per decimetre, straight, acicular, 1.5–8 mm long, 8–16 times longer than wide; stellae absent; finger hairs present, not gland-tipped, 3–6 mm long; Type 2 hairs sparse to dense. *Adult leaves* broadly ovate or orbicular, entire or shallowly to deeply lobed throughout; lobes 2–4 on each side, acute or obtuse, lobing index 1–3; lamina 7.5–16.5 cm long, 6–13 cm wide, 1–1.3 times longer than broad, apex acute, base obtuse or cordate, oblique part 0–6 mm long, obliqueness index 0–4 percent; petioles 3.8–6.2 cm long, 35–55% length of lamina, prickles present. *Upper leaf surface* green; prickles 4–30, straight, acicular or broad-based, 3–10 mm long, prickles present on midvein and lateral veins; stellate hairs absent; finger hairs present, 0.5–2 mm apart, not gland-tipped, 1–4 mm long; Type 2 hairs present only in vein depressions. *Lower leaf surface* green; prickles 30–50, straight, acicular or broad-based, prickles present on midvein and lateral veins; stellae absent; finger hairs present, 0.6–6 mm apart, not gland-tipped, 1.5–3 mm long or absent; Type 2 hairs present only on veins. *Inflorescence* supra-axillary, solitary or pseudo-racemose, common peduncle absent, rachis prickles present; 1–5-flowered, weakly andromonoecious, flowers 5-merous; pedicels 8–21 mm long at anthesis, same thickness throughout, 0.3–0.4 mm thick at mid-point, prickles present. Calyx tube 1–3 mm long, lobes deltate, 1.5–3 mm long; prickles present at anthesis, 20–30 per flower, 1.5–6 mm long; stellae absent; finger hairs present; Type 2 hairs present. Corolla white, 7–10 mm long, deeply lobed, inner surface glabrous; anthers 4.5–6 mm long; ovary with Type 2 hairs only; functional style 5.5–7 mm long, erect, glabrous. *Fruiting calyx* with lobes less than half length of mature fruit, prickles 3–7 mm long. Mature fruits 1–3 per inflorescence, globular, 25–45 mm diameter, orange, 1-locular (septum absent or incomplete); placenta not apparent; mesocarp dry; exocarp *c.* 2 mm thick; pedicels 17–28 mm long in fruit, 1–1.4 mm thick at mid-point; seeds pale yellow, 4.8–5.5 mm long. *Devil's Apple.*

Selected specimens examined**: Queensland.** Cook District: Malanda Falls N.P., Jun 1965, *Cunningham s.n.* (BRI); S.F.310, Gadgarra, *c.* 4 km ESE of Lake Barrine, Mar 1976, *Moriarty* 1995 (BRI, QRS); edge of Lake Eacham, *c.* 45 km SSW of Cairns, Aug 1976, *Henderson* H2402 (BRI); Dismal Ck, 6 km W of Kuranda, Sep 1999, *Wannan* 1401 *et al.* (BRI). South Kennedy District: 9 miles [14 km] SW of Pinnacle, Jan 1964, *Mayne s.n.* (BRI); Eungella, Apr 1978, Byrnes 3696 & *Clarkson* (BRI); Slade Point dunal system, Mar 1993, *Champion* 782 (BRI). Burnett District: Cherbourg, *c.* 6 miles [10 km] SE of Murgon, Oct 1969, *coll. unknown* (BRI). Wide Bay District: Sandy Ck, Biggenden–Childers road, Dec 1969, *Colbran s.n.* (BRI); Lake Cootharaba, side of Mill Point track, Apr 1986, *Sandercoe* C1160 & *Milne* (BRI); Currymore, NW of Maleny, Apr 1993, *Bean* 6016 (BRI, NSW). Moreton District: Virginia near Brisbane, Nov 1915, *White s.n.* (BRI); Myer's Ferry, Southport, Apr 1920, *Francis s.n.* (BRI); 2 km S of Alstonville, Aug 1985, *Reynolds & Calway s.n.* (BRI); Natural Bridge N.P., Numinbah Valley, Feb 2000, *Bean* 16006 (BRI); North Tamborine Environmental Park, Mt Tamborine, Mar 2001, *Boyle* TPB185 & *Phillips* (BRI). **New South Wales.** North Coast: Kings Beach, Broken Head, Mar 1982, *Hind* 3039 (BRI, NSW); Tuckean Island road, W of Wardell, Apr 2001, *Bean* 17577 (BRI, NSW).

Distribution and habitat**:** *Solanum capsicoides* is indigenous to coastal Brazil (Whalen 1984). It is widely naturalised in coastal and subcoastal areas of Queensland and northern New South Wales (**Map 14**). It inhabits degraded sites, or rainforest margins, prefering moist shady areas.

Phenology**:** Flowers and fruits may be found at any time of the year.

Notes**:** *S. capsicoides* was first recorded as naturalised for Queensland by Bailey (1881), under the name *S. aculeatissimum* Jacq., to which it is closely related. The differences were outlined by Welman (2003).

S. capsicoides completely lacks stellate hairs; the indumentum comprises finger hairs and Type 2 hairs.

Group 25 (S. hystrix group) of Whalen (1984)

Small plants <1 m high (100%); the leaves green on upper surface (100%); corolla inner surface glabrous (100%); seeds pale yellow (100%); adult leaves lobed (100%); calyx prickles >5 per flower (100%); inflorescence weakly to strongly andromonoecious (100%); calyx lobes not exceeding mature fruits (100%); prickles present on both upper leaf surface (100%); branchlet prickles acicular (95%); prickles present on lower leaf surface (95%); the herbaceous resprouter habit (90%); mature fruits yellow-green to green (90%); adult leaves with winged petioles (50%); finger hairs on upper leaf surface (50%); style sigmoid (30%).

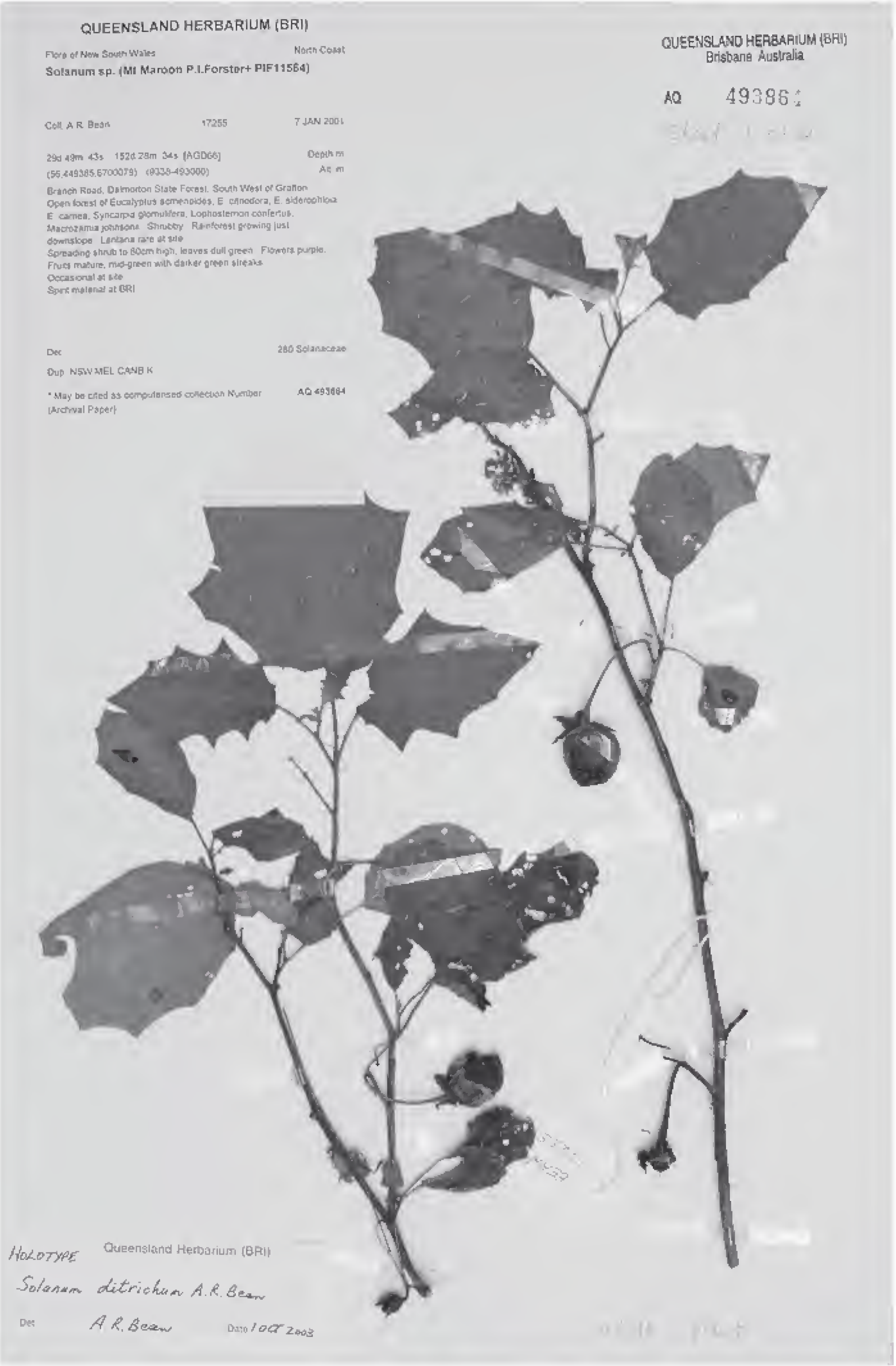
19 species endemic to Australia; 10 species indigenous to Queensland.

34. Solanum ditrichum A.R.Bean **sp. nov.** Frutex fusus humilis; ramuli pilis digitatis abundis sed pilis stellatis raris vel absentibus; folia adulta 3–6 paribus loborum acutorum non profundorum, et usque ad 100 aculeos in superficiebus ambabus, stellis superficiei superioris radio centrali radiis lateralibus 2–3plo longiore; calyx aculeatus sed non accrescens; stylus functionalis sigmoideus; semina flaveola. **Typus:** New South Wales. North Coast: Branch road, Dalmorton State Forest, SW of Grafton, 7 January 2001, *A.R. Bean* 17255 (holo: BRI (2 sheets + spirit); iso: CANB, K, MEL, NSW).

Solanum sp. (Mt Maroon P.I. Forster+ PIF11564) in Henderson (2002).

Prostrate or sprawling, herbaceous resprouter, 0.1–0.6 m high. Juvenile stage absent. Adult branchlets green; prickles 80–180 per decimetre, straight, acicular, 1–7 mm long, 10–17 times longer than wide; stellae sparse, 0.5–0.6 mm diameter, stalks 0–0.1 mm long; lateral rays 5–8, porrect; central ray present, 0.7–1.5 times as long as laterals, not gland-tipped; finger hairs abundant, gland-tipped, 0.1–0.7 mm long; Type 2 hairs absent. *Adult leaves* ovate or broadly ovate, shallowly lobed throughout; lobes 3–6 on each side, acute, lobing index 1.2–1.4; lamina 6–12.5 cm long, 4.5–9.5 cm wide, 1.3–1.8 times longer than broad, apex acute, base obtuse or cordate, oblique part 1–10 mm long, obliqueness index 2–11 percent; petioles 2–5.6 cm long, 20–50% length of lamina, prickles present. *Upper leaf surface* green; prickles 15–100, straight, acicular, 2–8 mm long, prickles present on midvein and lateral veins; stellate hairs distributed throughout; protostellae absent; ordinary stellae sparse, 0.8–1.7 mm apart, 0.3–0.4 mm across, sessile; lateral rays 4–7, porrect; central ray 2–3 times as long as laterals, not gland-tipped; finger hairs present, 0.4–1.2 mm apart, not gland-tipped or gland-tipped, 0.1–0.6 mm long; Type 2 hairs absent. *Lower leaf surface* green; prickles 30–100, straight, acicular, present on midvein and lateral veins; stellae sparse to moderate, 0.4–1.5 mm apart, 0.5–0.7 mm diameter, sessile; lateral rays 4–8, porrect; central ray 1–1.7 times as long as laterals, not gland-tipped; finger hairs present, 0.3–1 mm apart, gland-tipped, 0.1–0.6 mm long; Type 2 hairs absent. *Inflorescence* supra-axillary, pseudo-racemose, common peduncle 2–16 mm long, rachis prickles present; 2–5-flowered, weakly andromonoecious, flowers 5-merous; pedicels 5–18 mm long at anthesis, markedly thicker distally, 0.4–1 mm thick at mid-point, prickles present. Calyx tube 3–5 mm long, lobes deltate or attenuate, 4–8 mm long; prickles present at anthesis, 36–70 per flower, 2–7 mm long; stellae sparse, transparent, 0.4–0.5 mm across, sessile, lateral rays 4–8, central ray 1–1.5 times as long as laterals, not gland-tipped; finger hairs present; Type 2 hairs absent. Corolla purple, 9–17 mm long, rotate, inner surface glabrous; anthers 4–5 mm long; ovary glabrous, or with Type 2 hairs only; functional style 9–10.5 mm long, sigmoid, glabrous. *Fruiting calyx* with lobes less than half length of mature fruit, prickles 2–7 mm long. Mature fruits 1 or 2 per inflorescence, globular, 21–26 mm diameter, yellowish-green or pale green with dark green streaks, 2-locular; placenta in cross-section stalked, anvil-shaped; mesocarp moist but not juicy; exocarp *c.* 2.5 mm thick; pedicels 15–28 mm long in fruit, 1.3–2 mm thick at mid-point; seeds pale yellow, 2.3–2.6 mm long. **Fig. 3, 24.**

***Specimens examined*:** **Queensland.** Wide Bay District: Gympie, undated, *Kenny* (BRI); Kin Kin, Mar 1916, *Francis & White s.n.* (BRI). Darling Downs District: top of Mt Mitchell, Main Range, Jul 1930, *White* 6881 (BRI); S.F.401, 2 km W of Mt Huntley, Oct 1992, *Forster* PIF11852 *et al.* (AD, BRI, K, L, MEL, NSW); Portion 90, Wyberba, near Girraween N.P., Sep 1993, *Bean* 6409 & *Forster* (BRI); 6 km from Mt Colliery towards Gambubal S.F., E of Warwick, Apr 1999, *Bean* 14806 (BRI). Moreton District: Yandina, Mar 1891, *Simmonds s.n.* (BRI); Springbrook, Sep 1929, *White* 6244 (BRI); foot of Mt Ernest, Oct 1932, *Blake* 4287 (BRI); Campbell's Folly, 4 km SW of Tylerville, Sep 1992, *Forster* PIF11523 & *Leiper* (AD, BRI); Mt Maroon, summit area, Sep 1992, *Forster* PIF11564 & *Leiper* (BRI, MEL); Mt Gillies, Oct 1992, *Forster* PIF12076 & *Reilly* (AD, BRI); Duck Creek road, near O'Reilly's Guest House, Jan 2000, *Bean* 15972 (BRI, NSW); Wilkies Scrub, Wongawallan, 7 km W of Coomera, Jul 2001, *Bean* 17689 (BRI, CANB, L, MO). **New South Wales.** Northern Tablelands: Gibraltar Range N.P., *c.* 67 km E of Glen Innes, Oct 1969, *Coveny* 2236 (AD, BRI, NSW); *c.* 12 km from Tenterfield on road to Bluff Rock, Sep 1976, *Pearce* 87 (NSW); *c.* 3 km S of



QUEENSLAND HERBARIUM (BRI)

Flora of New South Wales North Coast

Solanum sp. (Mt Maroon P.I.Forster+ PIF11564)

Coll. A.R. Bean 17255 7 JAN 2001

29d 49m 43s 152d 28m 34s (AGD66) Depth m

(56.449385.6700079) (9338-493000) Alt m

Branch Road, Dalmorton State Forest. South West of Grafton.
Open forest of Eucalyptus acmenoides, E. citriodora, E. siderophloia
E. carnea, Syncarpia glomulifera, Lophostemon confertus.
Macrozamia johnsonii. Shrubby. Rainforest growing just
downslope. Lantana rare at site
Spreading shrub to 80cm high, leaves dull green. Flowers purple.
Fruits mature, mid-green with darker green streaks.
Occasional at site
Spirit material at BRI

Det 280 Solanaceae

Dup NSW MEL CANB K

* May be cited as computerised collection Number AQ 493864
(Archival Paper)

QUEENSLAND HERBARIUM (BRI)
Brisbane Australia

AQ 493864

HOLOTYPE Queensland Herbarium (BRI)

Solanum ditrichum A.R. Bean

Det A.R. Bean Date 1 OCT 2003

Fig. 24. Holotype of ***Solanum ditrichum***.

Wallangarra on main road to Tenterfield, Dec 1977, *Haegi* 1547 (BRI, NSW); 29 km N of Tenterfield, off the Mt Lindesay Hwy, Bungoona track to summit in Bald Rock N.P., Oct 1993, *Coveny* 16560 & *Whalen* (AD, BRI, MO, NSW). North Coast: Toonumbar S.F., *c.* 26 km NW of Kyogle, Feb 1972, *Henderson* H1265 (BRI); Mountaineer track, Chichester S.F., Dungog, Jun 1974, *Swan* 24 (AD, BRI); Whian Whian S.F., N of Lismore, Aug 1975, *Moriarty* 1707 (BRI); summit of Bald Knob, 10 km W of Woodenbong, Sep 1998, *Bean* 13799 (BRI); Mt Warning, Oct 1963, *Johnson* 2730 (BRI); Ewingar S.F., S of Tabulam, Feb 2001, *Bean* 17331 (BRI, NSW).

***Distribution and habitat*:** *Solanum ditrichum* is a widespread species extending from Dungog in New South Wales to Mt Mee in Queensland (plus historical records from Yandina, Kin Kin and Gympie) (**Map 16**). It grows in wet sclerophyll eucalypt forest or on rainforest margins.

***Phenology*:** Flowers and fruits are recorded for all months except May and June.

***Notes*:** *S. ditrichum* is closely related to *S. campanulatum* R.Br. It differs from *S. campanulatum* by having pale seeds, acute leaf lobes, calyx scarcely accrescent, finger hairs very short on upper leaf surface, and the stellate hairs rare or absent on branchlets. *S. campanulatum* is restricted to the greater Sydney area, as far north as Denman and Scone.

The mature fruits of *S. ditrichum* remain green to yellowish-green at maturity, although they may have some light streaking of purple at the pedicel end (R. Fensham pers. comm.)

***Conservation status*:** Widespread. Not considered at risk.

***Etymology*:** From the Greek *di-* meaning two or double, and *-trichos* meaning hair. This refers to presence of both stellate and finger hairs on the leaves of this species.

35. Solanum cookii Symon, J. Adelaide Bot. Gard. 4: 233 (1981). **Type:** cultivated at Waite Institute (ex Upper Lankelly Creek, Cape York Peninsula, Queensland), 25 February 1972, *D.E. Symon s.n.* (holo: AD; iso: BRI, CANB, K).

Solanum adenophorum var. *indivisum* Domin, Biblioth. Bot. 89: 586 (1929). **Type:** Queensland. North Kennedy District: Rockingham Bay, undated, *J. Dallachy* (holo: K, *n.v.*), *fide* Symon (1981).

***Illustration*:** Symon (1981: 234)

Prostrate or sprawling, herbaceous resprouter, 0.1–0.5 m high. Juvenile stage absent. Adult branchlets green; prickles 30–300 per decimetre, straight, acicular, 1–8 mm long, 12–17 times longer than wide; stellae sparse to dense, 0.6–1 mm diameter, stalks 0–0.2 mm long; lateral rays 4 or 5, porrect; central ray 2–5 times as long as laterals, gland-tipped; finger hairs present, gland-tipped, 0.2–1.7 mm long; Type 2 hairs absent. *Adult leaves* ovate or broadly ovate, shallowly lobed throughout; lobes 4 or 5 on each side, acute, lobing index 1.1–1.2; lamina 5–10.5 cm long, 4–7.5 cm wide, 1.3–1.7 times longer than broad, apex acute, base obtuse or cordate, oblique part 0–8 mm long, obliqueness index 0–8 percent; petioles 3.4–5.4 cm long, 40–55% length of lamina, prickles present. *Upper leaf surface* green; prickles 30–145, straight, acicular, 1–7 mm long, prickles present on midvein and lateral veins; stellate hairs absent; finger hairs present, 0.1–0.6 mm apart, not gland-tipped or gland-tipped, 0.2–2 mm long; Type 2 hairs present throughout, 0.1–1 mm apart. *Lower leaf surface* green; prickles 20–65, straight, acicular, present on midvein only or present on midvein and lateral veins; stellae very sparse to moderate, 0.5–3 mm apart, 0.5–0.9 mm diameter, stalks 0–0.2 mm long; lateral rays 4–6, porrect; central ray 2–5 times as long as laterals, not gland-tipped; finger hairs present, 0.1–0.3 mm apart, not gland-tipped or gland-tipped, 0.1–1.4 mm long; Type 2 hairs absent. *Inflorescence* supra-axillary, pseudo-racemose, common peduncle 18–27 mm long, rachis prickles present; 2–7-flowered, with all flowers bisexual and 5-merous; pedicels 4–7 mm long at anthesis, same thickness throughout, 0.2–0.4 mm thick at mid-point, prickles present. Calyx tube 1.5–3 mm long, lobes attenuate, 7–11 mm long; prickles present at anthesis, 25–35 per flower, 2.5–6 mm long; stellae absent or sparse or moderate, transparent, 0.5–0.7 mm across, stalks 0–0.1 mm long, lateral rays 2–4, central ray 4–6 times as long as laterals, not gland-tipped; finger hairs present; Type 2 hairs absent. Corolla mauve, 8–12 mm long, shallowly lobed, inner surface glabrous; anthers 3.5–5 mm long; ovary with Type 2 hairs only; functional style 5–6 mm long, erect, glabrous. *Fruiting calyx* with lobes more than or exceeding mature fruit, prickles 2.5–6 mm long. Mature fruits 1–6 per inflorescence, globular, 11–13 mm diameter, green, 2-locular; placenta in cross-section stalked, circular to elliptical; mesocarp moist but not juicy; exocarp 0.6–0.7 mm thick; pedicels 5–9 mm long in fruit, 0.6–1 mm thick at mid-point; seeds pale yellow, 1.8–2 mm long.

Specimens examined: **Queensland.** COOK DISTRICT: *c.* 6 miles [10 km] SW of Yungaburra, Curtain Fig site, Dec 1968, *Tracey* (BRI); Upper Lankelly Creek, western slopes of McIlwraith Range, NE of Coen, Oct 1969, *Webb & Tracey* 8355 (BRI); S.F.144, Agapetes L.A., Dec 1979, *Hyland* 10174 (BRI, QRS); S.F.191, Parish of Barron, Dec 1991, *Hyland* 14405 (BRI, QRS); S.F.194, Parish of Western, Mar 1994, *Hyland* 15052 (QRS); Klondike Mine road, May 1995, *Hyland* 15329 (QRS); Shiptons Flat, Jun 1996, *Jago* 4025 & *Roberts* (BRI); Wongabel S.F.191, Nov 1997, *Forster* PIF21929 *et al.* (BRI, MEL, QRS). NORTH KENNEDY DISTRICT: Tully Falls, Oct 1948, *Fielding* (QRS); Elphinstone Ck, Coldwater, 24 km W of Ingham, Jun 1972, *Seton* (BRI); 'Bellview', Evelyn, Jan 1974, *Collins* (BRI); Elliots Toe, Mt Elliot, Jun 1990, *Cumming* 9965 (BRI); Keoghs Scrub, Portion 205, Parish of Herberton, Oct 1993, *Gray* 5717 (QRS).

Distribution and habitat**:** *Solanum cookii* is endemic to Queensland. Sporadically distributed along the east coast from Coen to Townsville (**Map 12**). It grows on disturbed sites in microphyll or tall notophyll rainforest, or on the margin with woodland communities. Altitude is usually between 500–1100 metres, but it has occasionally been found near sea level.

Phenology**:** Flowers are recorded from November to February, and also June; mature fruits are recorded from October to February, and also in June.

Notes**:** *S. cookii* has very long finger hairs on upper leaf surface, while on the lower surface, finger hairs are mixed with stellate hairs (lateral rays often poorly developed).

Conservation status**:** *S. cookii* has been collected from about 7 locations in north Queensland over the last 10–15 years. It is not currently known from a conservation reserve. Applying the IUCN guidelines (IUCN. 2001), a category of "Near Threatened" is recommended.

36. Solanum multiglochidiatum Domin, Biblioth. Bot. 89: 586 (1929). **Type:** Queensland. COOK DISTRICT: near Mungana, February 1910, *K. Domin* (holo: ?PR), *n.v.*

Illustration**:** Symon (1981: 232)

Prostrate or sprawling, herbaceous resprouter, 0.2–0.4 m high. Juvenile stage absent. Adult branchlets brown; prickles 140–320 per decimetre, straight, acicular, 1–6 mm long, 13–20 times longer than wide; stellae sparse to dense, 0.3–0.45 mm diameter, stalks 0–0.1 mm long; lateral rays 5–8, porrect; central ray 0.3–0.7 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Adult leaves* broadly ovate or orbicular, entire or shallowly lobed throughout; lobes 2 or 3 on each side, obtuse, lobing index 1–1.1; lamina 6.5–9.5 cm long, 3.4–6 cm wide, 1.1–2.1 times longer than broad, apex obtuse, base cuneate or obtuse, oblique part 0–6 mm long, obliqueness index 0–6 percent; petioles 1.2–1.7 cm long, 13–25% length of lamina, prickles present. *Upper leaf surface* green; prickles 100–400, straight, acicular, 1–6 mm long, prickles present on midvein and lateral veins; stellate hairs distributed throughout; protostellae absent; ordinary stellae very sparse to sparse, 0.8–2.5 mm apart, 0.25–0.45 mm across, sessile; lateral rays 3–7, porrect; central ray 0.8–1.6 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Lower leaf surface* green; prickles 40–250, straight, acicular, present on midvein and lateral veins; stellae sparse to dense, 0.3–1.4 mm apart, 0.5–0.7 mm diameter, stalks 0–0.1 mm long; lateral rays 6–8, porrect; central ray 0.5–1 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Inflorescence* supra-axillary, pseudo-racemose, common peduncle 17–27 mm long, rachis prickles present; 6–10-flowered, weakly andromonoecious, flowers 5-merous; pedicels 8–14 mm long at anthesis, same thickness throughout, 0.5–0.8 mm thick at mid-point, prickles present. Calyx tube 2.5–4 mm long, lobes attenuate, 3–6 mm long; prickles present at anthesis, 36–50 per flower, 1.5–4 mm long; stellae moderate to dense, transparent, 0.4–0.5 mm across, stalks 0–0.1 mm long, lateral rays 4–8, central ray 0.8–1.2 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. Corolla white or mauve, 13–18 mm long, rotate, inner surface glabrous; anthers 6.5–8.5 mm long; ovary with Type 2 hairs only, or with stellate and Type 2 hairs; functional style 11–14 mm long, sigmoid, with Type 2 hairs only or with stellate and Type 2 hairs, stellae 0.2–0.4 mm across, lateral rays 6–8, central ray 1–2 times as long as laterals. *Fruiting calyx* with lobes less than or more than half length of mature fruit, prickles 1.5–4 mm long. Mature fruits 1–6 per inflorescence, globular, 16–21 mm diameter, yellowish-green or green, 1-locular (septum absent or incomplete); placenta in cross-section sessile, elliptical; mesocarp moist but not juicy; exocarp 0.4–0.5 mm thick; pedicels 18–23 mm long in fruit, 1.4–2 mm thick at mid-point; seeds pale yellow, 3.3–3.5 mm long.

***Specimens examined*: Queensland.** Cook District: 24 km W of Petford and *c.* 48 km SE of Chillagoe, May 1967, *Symon* 4873 (AD, BRI, CANB, K, L, NSW); Palmer River, Feb 1978, *Hinton* 61 (BRI); Holmes Creek, 3.5 km WNW of Mt Carbine, Jan 1984, *Clarkson* 5105 (AD, BRI, CANB, K, MEL, MO, QRS); 12.6 km SE of Mt Janet, 11.5 km SW of Lakeland Downs township, Jan 1986, *Clarkson* 6293 (AD, BRI, DNA, PERTH, QRS); 9 km SW of Lakeland Downs township, Jan 1986, *Clarkson* 6298 (AD, BRI); 4 km SE of Chillagoe, Jan 1996, *Gray* 6506 (QRS); 4.7 km from Walsh River crossing, N of Chillagoe, Mar 2000, *McDonald* KRM335 (BRI); 14 km W of Chillagoe, Apr 2002, *Bean* 18734 & *McDonald* (BRI). North Kennedy District: 40 Mile Scrub, [SW of Mt Garnet], Mar 1989, *Sankowsky* 979 & *Sankowsky* (BRI).

***Distribution and habitat*:** *Solanum multiglochidiatum* is endemic to Queensland, extending from Lakeland Downs to Forty Mile Scrub (**Map 8**). It usually grows in shrubby eucalypt woodland dominated by *Eucalyptus cullenii, E. leptophleba* or *E. dallachiana*, on gently undulating terrain, in clay-loam soils. There is one record from deciduous microphyll vine thicket.

***Phenology*:** Flowers are recorded from January to March; mature fruits from January to May.

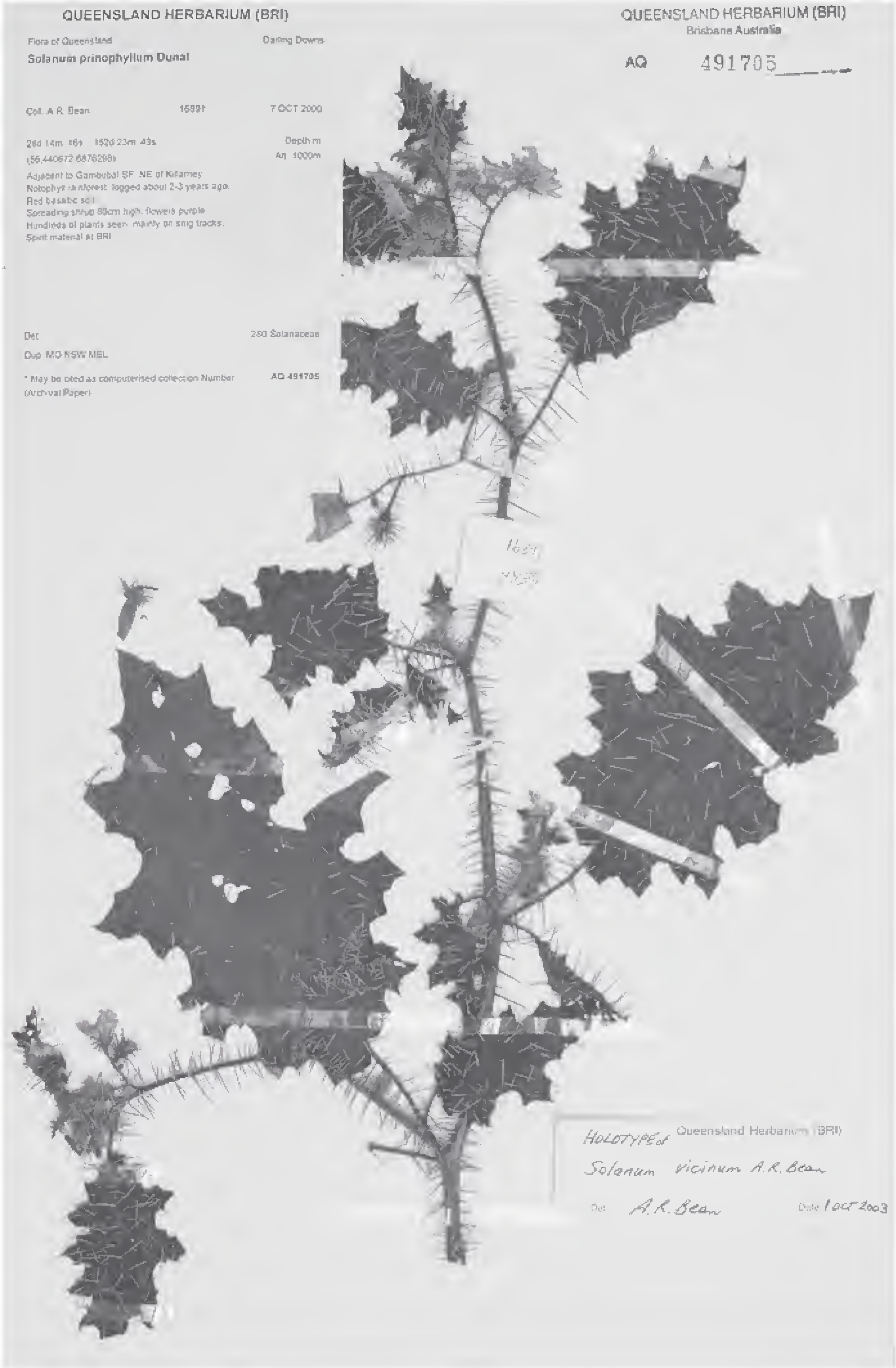
Notes: The type of *S. multiglochidiatum* was sought from PR, but not received. Symon (1981) stated that he had not seen the type. It is possible that the type is missing, but the designation of a neotype is not warranted until further searches are made. The application of the name is not in doubt, as the species is well described in the protologue.

***Conservation status*:** *S. multiglochidiatum* has been collected from about 7 locations in north Queensland over the last 15 years. It is not known from a conservation reserve. Applying the IUCN guidelines (IUCN. 2001), a category of "Near Threatened" is recommended. It is currently listed as "Rare" under the Queensland Nature Conservation Act, 1992.

37. Solanum vicinum A.R.Bean **sp. nov.** Frutex parvus, aculeis abundis in ramulis foliis calycibusque; stellae ramulorum 0.4–0.5 mm diametro; folia non profunde lobata, ovata usque late ovata, utrinque viridia; pedunculus communis in inflorescentia praesens; corolla 11–18 mm longa; stylus functionalis sigmoideus; fructus maturitate purpureus, globularis, 24–30 mm diametro. **Typus:** Queensland. Darling Downs District: adjacent to Gambubal State Forest, NE of Killarney, 7 October 2000, *A.R. Bean* 16891 (holo: BRI (1 sheet + spirit); iso: MEL, MO, NSW).

[*S. prinophyllum auct., non* Dunal]

Erect, rhizomatous perennial shrub, 0.2–0.9 m high. Juvenile branchlets with 200–500 prickles per dm, 4–9 mm long; leaves (in outline) broadly ovate, shallowly-lobed, with 3–5 pairs of lobes; lamina 6–7 cm long, 5–6 cm wide, with *c.* 100 prickles on upper surface. Adult branchlets brown or green; prickles 90–180 per decimetre, straight, acicular, 1–11 mm long, 12–18 times longer than wide; stellae sparse, 0.4–0.5 mm diameter, stalks 0–0.15 mm long; lateral rays 5–8, porrect; central ray 0.5–1.2 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Adult leaves* ovate, shallowly lobed throughout; lobes 4–6 on each side, acute, lobing index 1.4–1.9; lamina 7.5–14 cm long, 4–9.5 cm wide, 1.5–2.1 times longer than broad, apex acute, base cuneate or obtuse, oblique part 1.5–7 mm long, obliqueness index 1–8 percent; petioles 1.7–3.7 cm long, 18–30% length of lamina, prickles present. *Upper leaf surface* green; prickles 100–200, straight, acicular, 3–11 mm long, prickles present on midvein and lateral veins; stellate hairs distributed throughout; protostellae absent; ordinary stellae density sparse to moderate, 0.6–1.3 mm apart, 0.4–0.5 mm across, sessile; lateral rays 4–8, porrect; central ray 0.8–1.5 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Lower leaf surface* green; prickles 100–200, straight, acicular, present on midvein and lateral veins; stellae very sparse to sparse,



QUEENSLAND HERBARIUM (BRI)

Flora of Queensland Darling Downs

Solanum prinophyllum Dunal

Col. A R. Bean 16891 7 OCT 2000

28d 14m 16s 152d 23m 43s Depth m

(56 440672 6876298) Alt 1000m

Adjacent to Gambubal SF NE of Killarney
Notophyll rainforest, logged about 2-3 years ago.
Red basaltic soil
Spreading shrub 80cm high, flowers purple
Hundreds of plants seen mainly on snig tracks.
Spirit material at BRI

Det 260 Solanaceae

Dup MO NSW MEL

* May be cited as computerised collection Number AQ 491705
(Archival Paper)

QUEENSLAND HERBARIUM (BRI)
Brisbane Australia

AQ 491705

HOLOTYPE of Queensland Herbarium (BRI)

Solanum vicinum A.R. Bean

Det A.R. Bean Date 1 OCT 2003

Fig. 25. Holotype of ***Solanum vicinum***.

0.7–2.2 mm apart, 0.5–0.7 mm diameter, sessile; lateral rays 4–8, porrect; central ray 0.5–1.5 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Inflorescence* supra-axillary, pseudo-racemose, common peduncle 0–8 mm long, rachis prickles present; 3–8-flowered, flowers 5-merous; pedicels 6–15 mm long at anthesis, same thickness throughout, 0.3–0.7 mm thick at mid-point, prickles present. Calyx tube 3–4.5 mm long, lobes attenuate, 3.5–10 mm long; prickles present at anthesis, 50–100 per flower, 1–8 mm long; stellae moderate, yellow or white, 0.3–0.5 mm across, sessile, lateral rays 4–7, central ray 0.5–1 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. Corolla purple, 11–18 mm long, rotate or shallowly lobed, inner surface glabrous; anthers 3.5–5 mm long; ovary with Type 2 hairs only; functional style 8–12 mm long, sigmoid, glabrous or with Type 2 hairs only. *Fruiting calyx* with lobes less than or more than half length of mature fruit, prickles 1–8 mm long. Mature fruits 1 or 2 per inflorescence, globular, 24–30 mm diameter, purple, 2-locular; placenta in cross-section stalked, anvil-shaped; mesocarp moist but not juicy; exocarp 3–3.5 mm thick; pedicels 20–34 mm long in fruit, 1.3–2 mm thick at mid-point; seeds pale yellow, 1.9–2.4 mm long. **Fig. 25.**

***Specimens examined*: Queensland**. WIDE BAY DISTRICT: Peters L.A., Conondale Ranges, Dec 1990, *Bean* 2699 (BRI). DARLING DOWNS DISTRICT: *c.* 1 km ENE of Gambubal Forest Station, E of Warwick, Dec 1996, *Bean* 11426 (BRI); Goomburra S.F., *c.* 1.5 km W of Mt Castle Lookout carpark, NE of Warwick, Jan 2003, *Bean* 19929 (BRI). MORETON DISTRICT: Mt Glorious, Jan 1965, *Henderson* H104 (BRI); D'Aguilar Range, on top of Tenison Woods Mt, Jul 1974, *Swan* 55 (BRI); Lewington Road, Mt Mee, Sep 1992, *Symon s.n.* (BRI). **New South Wales**. NORTHERN TABLELANDS: Hillgrove near Armidale, Sep 1971, *McBarron*, 20291 (BRI, NSW). NORTH COAST: Dorrigo S.F., Oct 1930, *White* 7809 (BRI); *c.* 6 miles [10 km] along Doyles River road, *c.* 48 miles [77 km] W of Wauchope, Oct 1951, *Ford s.n.* (AD, BRI, NSW); Toonumbar S.F., 21 miles [34 km] NW of Kyogle, Sep 1972, *Coveny* 4571 & *Rodd* (BRI, NSW); near Mt Boss, NW of Wauchope, Nov 1999, *Bean* 15712 (BRI, NSW); Welsh's Road, Clouds Creek S.F., N of Dorrigo, Sep 2000, *Bean* 16855 (BRI, CANB, MEL, NSW); Bellangry S.F. lookout, NW of Wauchope, Dec 2000, *Bean* 17230 (BRI, NSW); Armidale – Kempsey road, 10.7 km S of Styx River, Dec 2000, *Bean* 17233 (BRI, NSW).

***Distribution and habitat*:** *Solanum vicinum* is uncommon in Queensland, known from just a few locations as far north as Conondale Ranges (**Map 17**). Reasonably widespread in north-eastern N.S.W., as far south as Wauchope. It grows in notophyll rainforest, or on the margins of same, usually at relatively high altitude.

***Phenology*:** Flowers are recorded from September to February; mature fruits are recorded in May, September and December.

***Notes*:** Closely related to *Solanum prinophyllum* Dunal, and regarded by Symon (1981) as the northern form of that species. *S. vicinum* differs from *S. prinophyllum* by: branchlets with 90–180 prickles per decimetre (30–65 for *S. prinophyllum*), branchlet stellae 0.4–0.5 mm diameter (0.25–0.3 mm diameter for *S. prinophyllum*), shallowly-lobed leaves (lobing index of 1.4–1.9 *vs.* index of 2–4 for *S. prinophyllum*), inflorescences 3–8 flowered with common peduncle usually present and up to 8 mm long (inflorescences 1–3 flowered, common peduncle absent for *S. prinophyllum*), and corolla 11–18 mm long (7–9 mm long for *S. prinophyllum*).

Solanum prinophyllum sens. str. is perhaps more closely related to *S. pungetium* R.Br. than it is to *S. vicinum*. *S. prinophyllum* and *S. pungetium* are not easily separable, but I have noted the following differences, based on collections from central and southern coast of N.S.W.: The leaves and branchlets of *S. prinophyllum* are glabrous to sparsely hairy (always moderately to densely hairy for *S. pungetium*); the stellae of the upper leaf surface in *S. prinophyllum* (when present) are 0.2–0.35 mm diameter, with 6–8 lateral rays and the central ray 0–0.7 times as long as laterals. In *S. pungetium*, the corresponding stellae are 0.35–0.5 mm diameter, with 4 or 5 lateral rays and a central ray 1–1.5 times as long as laterals; the leaves, pedicels and calyces of *S. prinophyllum* tend to have a greater number of prickles; *S. prinophyllum* leaves have 4–6 pairs of lobes, and the lobes may themselves have small lobes or angles, whereas *S. pungetium* leaves have 3 or 4 pairs of lobes, and the lobes are always "simple".

The few specimens I have seen from Victoria suggest that the patterns of variation are different again, and if both species are present there, they are even less distinct.

While I feel sure that *S. prinophyllum* and *S. pungetium* differ sufficiently to warrant species status for both, it will require a detailed field study to determine the exact relationships involved. The character most often used to separate *S. pungetium* in identification keys, namely the reduced 1 or 2 flowered inflorescence without a common peduncle, is not diagnostic. Both species can have this feature.

***Conservation status*:** Widespread. Not considered at risk.

***Etymology*:** From the Latin *vicinus* - near, neighbouring. This is a reference to its close affinity to *S. prinophyllum*.

38. Solanum papaverifolium Symon, Trans. & Proc. Roy. Soc. South Australia 95: 233–4 (1971). **Type:** New South Wales. 'Maneroo', Graman, *c.* 56 km north-west of Inverell, 11 June 1969, *V.N. Gidley s.n.* (holo: NSW; iso: AD, BRI, CANB, K, NSW).

***Illustration*:** Symon (1981: 180)

Prostrate or sprawling, herbaceous resprouter, 0.2–0.4 m high. Juvenile stage absent. Adult branchlets brown or green; prickles 15–40 per decimetre, straight, acicular, 1–6 mm long, 10–13 times longer than wide; stellae absent; finger hairs absent; Type 2 hairs absent, or sparse. *Adult leaves* broadly ovate, deeply lobed throughout; lobes 4–6 on each side, acute, lobing index 4–27; lamina 4–9 cm long, 2.6–6.5 cm wide, 1.4–1.8 times longer than broad, apex acute, base cuneate, oblique part 0–4 mm long, obliqueness index 0–5 percent; petioles 2.1–3.4 cm long, 25–60% length of lamina, winged, prickles present. *Upper leaf surface* green; prickles 20–50, straight, acicular, 0.5–7 mm long, prickles present on midvein and lateral veins; stellate hairs absent; finger hairs absent; Type 2 hairs absent. *Lower leaf surface* green; prickles 30–150, straight, acicular, present on midvein and lateral veins; stellae absent; finger hairs absent; Type 2 hairs absent. *Inflorescence* leaf-opposed, pseudo-racemose, common peduncle 24–33 mm long, rachis prickles present; 3–5-flowered, strongly or weakly andromonoecious, flowers 5-merous; pedicels 4–23 mm long at anthesis, same thickness throughout, 0.5–0.6 mm thick at mid-point, prickles present. Calyx tube 2–4 mm long, lobes deltate or attenuate, 2.5–6 mm long; prickles present at anthesis, 12–40 per flower, 1–5 mm long; stellae absent; finger hairs absent; Type 2 hairs present. Corolla purple, 7–11 mm long, rotate, inner surface glabrous; anthers 3.5–5 mm long; ovary glabrous, or with Type 2 hairs only; functional style 4.5–6 mm long, erect, glabrous or with Type 2 hairs only. *Fruiting calyx* with lobes more than half length of mature fruit, prickles 1–6 mm long. Mature fruits 1 or 2 per inflorescence, globular, yellowish-green or green; mesocarp moist but not juicy; pedicels 28–37 mm long in fruit, 0.9–1.3 mm thick at mid-point.

***Specimens examined*:** **Queensland.** DARLING DOWNS DISTRICT: Jimbour, Dec 1875, *Bailey* (BRI); 'Kuyura', Dec 1931, *Cadell* (BRI); Dalby, Nov 1941, *McMahon* (BRI); 'Yandilla', Nov 1951, *Everist s.n.* (BRI); Macalister, Jan 1942, *McCoy* (BRI); 'Paxton', Pirrinuan, via Dalby, Feb 1953, *Guard* (BRI); Brookstead, Apr 1959, *Keeley* (BRI); Hermitage Regional Experimental station, Warwick, Apr 1959, *Seton* 8 (BRI); Branch Creek road, Dalby, Dec 1970, *Mohen* (BRI); 'Kuyura', near Jimbour, Jan 1985, *Jensen* (BRI); 19 km SSW of Dalby, Feb 1995, *Fensham* 1912 (BRI); 5 km SE of Oakey, Feb 1995, *Fensham* 2085 (BRI); Clifton-Leyburn road, near Millbrook road turnoff, Jan 2002, *Bean* 18353 (BRI, MEL, NSW). **New South Wales.** NORTH WEST SLOPES: Bingara, Mar 1901, *McColl s.n.* (NSW). NORTH WEST PLAINS. 'Karina', Moree, May 1971, *Strange s.n.* (NSW).

***Distribution and habitat*:** *Solanum papaverifolium* has been recorded from between Jimbour and Warwick in Queensland (**Map 19**). In New South Wales, it has been found from Inverell to Quirindi and Singleton, and west to Narrabri and Moree. It grows on heavy clay soil, in grassland or open eucalypt woodland.

***Phenology*:** Flowers are recorded from October to March; mature fruits from November to April.

***Notes*:** F.M. Bailey, in 1875, was the first to collect the species in Queensland. Charles Moore had earlier collected it from "Liverpool Plains" in New South Wales. The next Queensland collection was in 1931, when a specimen was forwarded to C.T. White. He identified it as *S. hystrix* R.Br., a species from southern Australia, though he probably did not have access to authentic *S. hystrix* specimens. In 1939, while at Kew, he examined it again and determined that it was not *S. hystrix*, but "evidently a native".

In *S. papaverifolium*, the outer surface of the corolla often bears prickles. Only a few other species (including *S. hystrix*) display this characteristic.

***Conservation status*:** *S. papaverifolium* is currently known from 3 locations. It grows on soils that are utilized for agriculture. All populations are threatened by weeds, roadworks and agriculture, and none is protected in a conservation reserve. Currently listed as "Endangered" under the Queensland Nature Conservation Act, 1992.

Applying the IUCN guidelines (IUCN. 2001), the existing category of "Endangered" is endorsed (EN A3ce; B2ab(iii,v); C1).

The most recent N.S.W. collection was made in 1982, from Moree.

39. Solanum adenophorum F.Muell., Fragm. 2: 162 (1861); *S. adenophorum* var. *adenophorum* Domin, Biblioth. Bot. 89: 586 (1929); *S. adenophorum* var. *typicum* Domin, Biblioth. Bot. 89: 586 (1929), *nom. inval.* **Type:** [Queensland.] between the Dawson and Mackenzie Rivers, 17–20 November 1856, *F. Mueller* (holo: MEL).

Prostrate or sprawling, herbaceous resprouter, 0.15–0.3 m high. Juvenile stage absent. Adult branchlets grey or brown; prickles absent or present, 0–15 per decimetre, straight, acicular, 6–10 mm long, 12–17 times longer than wide; stellae absent; finger hairs present, gland-tipped, 0.4–0.8 mm long; Type 2 hairs dense. *Adult leaves* ovate or broadly ovate, deeply lobed throughout; lobes 3 or 4 on each side, obtuse, lobing index 2.3–5; lamina 3.5–5.5 cm long, 2–4 cm wide, 1.3–1.8 times longer than broad, apex obtuse, base cuneate to cordate, oblique part 0–6 mm long, obliqueness index 0–10 percent; petioles 1.2–4 cm long, 30–80% length of lamina, winged, prickles present. *Upper leaf surface* green; prickles 6–20, straight, acicular, 3–13 mm long, prickles present on midvein and lateral veins; stellate hairs absent; finger hairs present, 0.1–0.3 mm apart, gland-tipped, 0.5–0.9 mm long; Type 2 hairs absent. *Lower leaf surface* green; prickles 11–25, straight, acicular, present on midvein and lateral veins; stellae absent; finger hairs present, 0.3–0.5 mm apart, gland-tipped, 0.3–0.6 mm long; Type 2 hairs absent. *Inflorescence* supra-axillary, pseudo-racemose, common peduncle 9–26 mm long, rachis prickles present; 4–8-flowered, strongly andromonoecious, flowers 5-merous; pedicels 5–10 mm long at anthesis, same thickness throughout, 0.4–0.5 mm thick at mid-point, prickles absent or present. Calyx tube 2–3 mm long, lobes deltate, 2–4.5 mm long; prickles present at anthesis, 5–20 per flower, 3–6 mm long; stellae absent; finger hairs present; Type 2 hairs absent. Corolla white, 8–10 mm long, deeply lobed, inner surface glabrous; anthers 4.5–5.5 mm long; ovary with Type 2 hairs only; functional style 6–7 mm long, erect, with Type 2 hairs only. *Fruiting calyx* with lobes less than or more than half length of mature fruit, prickles 1–6 mm long. Mature fruits 1 per inflorescence, globular, *c.* 15 mm diameter, yellowish-green or green; pedicels 9–18 mm long in fruit, 0.9–1.2 mm thick at mid-point; seeds pale yellow, 2.8–3.5 mm long.

***Specimens examined*:** **Queensland.** SOUTH KENNEDY DISTRICT: Logan Downs Pty Ltd, 'Wentworth', 68 miles [109 km] N of Clermont, Oct 1957, *Saclier* 3 (BRI); 115 km NW of Clermont, Jul 1977, *Dale* 148 (BRI). LEICHHARDT DISTRICT: Blackwater Creek, *anno* 1871, *Bowman s.n.* (MEL); Marlborough–Sarina road, *c.* 45 miles [72 km] from Marlborough, May 1960, *Johnson* 1779 (BRI); Dipperu N.P., *c.* 24 km S of Nebo, Sep 1971, *McDonald* 143 (BRI); along boundary fence, Taunton N.P., Oct 1995, *Brushe* JB408 *et al.* (BRI); Taunton N.P., Oct 1996, *Porter* JB836 (BRI); Red Hill section of Taunton N.P., just N of Dingo, Aug 1998, *Melzer* 994 *& Clarke* (BRI).

***Distribution and habitat*:** *Solanum adenophorum* is endemic to Queensland, in the Dingo-Nebo-Clermont area, west and north-west of Rockhampton (**Map 13**). It is recorded mainly from brigalow (*Acacia harpophylla*) communities, but also from gidgee (*Acacia cambagei*) woodland. Soils are deep cracking clays.

***Phenology*:** flowers recorded in October; mature fruits recorded for May, September and October.

***Notes*:** *S. adenophorum* has very long petioles compared to most other Australian species. The longest petioles are on the lowermost leaves, hence it seems that the petioles continue to elongate after the leaf has fully expanded. The taxon known as *S. adenophorum* in New South Wales (Conn 1992) and Victoria (Jeanes 1999) is referable to *S. eremophilum* F.Muell. (Bean 2002a).

***Conservation status*:** Currently listed as 'Endangered' under the Queensland Nature

Conservation Act, 1992. It is threatened by habitat clearance, and by introduced weeds such as *Parthenium hysterophorus, Cenchrus ciliaris, Opuntia* spp. and *Acanthocereus tetragonus*. It is currently known only from a single location, *viz.* Taunton N.P.

Applying the IUCN guidelines (IUCN. 2001), a category of "Critically Endangered" is recommended (CR B2ab(iii,v)).

40. Solanum pusillum A.R.Bean **sp. nov.** Frutex prostratus vel fusus; aculei in ramulis foliis calycibusque praesentes; folia viridia, profunde lobata, in paginis superioribus stellis et digitis commixtis; petioli alati, longitudine 8–18% laminae aequantes; pili Type 2 in foliis calyce ovario styloque; inflorescentia pseudo-umbellata; corolla alba, 7–10 mm longa; fructus maturitate virides. **Typus:** Queensland. LEICHHARDT DISTRICT: western road, Junee State Forest, Junee Tableland, north of Dingo, 5 October 2002, *A.R. Bean* 19411 (holo: BRI).

Prostrate or sprawling, herbaceous resprouter, 0.1–0.3 m high. Juvenile stage absent. Adult branchlets brown or green; prickles 10–50 per decimetre, straight, acicular, 1–9 mm long, 10–16 times longer than wide; stellae sparse to dense, 0.8–1.2 mm diameter, stalks 0–0.1 mm long; lateral rays 4–7, porrect; central ray 0.8–1.5 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent, or sparse. *Adult leaves* elliptical or ovate, deeply lobed throughout; lobes 2–4 on each side, acute or obtuse, lobing index 2.3–4; lamina 3–5.5 cm long, 1.4–2.5 cm wide, 1.6–2.2 times longer than broad, apex obtuse or acute, base cuneate, oblique part 0–3 mm long, obliqueness index 0–7 percent; petioles 0.8–1.8 cm long, 8–18% length of lamina, winged, prickles absent or present. *Upper leaf surface* green; prickles 10–50, straight, acicular, 2–8 mm long, prickles present on midvein and lateral veins; stellate hairs distributed throughout; protostellae present; ordinary stellae very sparse to sparse, 0.8–1.7 mm apart, 0.3–1.1 mm across, sessile; lateral rays 1–4, porrect or ascending; central ray 1–4 times as long as laterals, not gland-tipped; finger hairs present, 0.5–3 mm apart, not gland-tipped, 0.8–1.3 mm long; Type 2 hairs present throughout, 0.1–0.4 mm apart. *Lower leaf surface* green, or yellowish; prickles 4–17, straight, acicular, present on midvein and lateral veins; stellae sparse to moderate, 0.2–1 mm apart, 0.7–1 mm diameter, stalks 0–0.1 mm long; lateral rays 4–7, porrect; central ray 0.8–1.5 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs present throughout, 0.05–0.2 mm apart. *Inflorescence* supra-axillary, solitary or pseudo-umbellate, common peduncle absent; 1–3-flowered, strongly andromonoecious, flowers 5-merous; pedicels 3–6 mm long at anthesis, same thickness throughout or markedly thicker distally, 0.4–0.6 mm thick at mid-point, prickles present. Calyx tube 1.5–2 mm long, lobes deltate, 1.5–3 mm long; prickles present at anthesis, 20–35 per flower, 2.5–6 mm long; stellae sparse to moderate, white, 0.7–1.1 mm across, sessile, lateral rays 4–8, central ray 1–1.5 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs present. Corolla white, 7–10 mm long, deeply lobed, inner surface glabrous; anthers 3–4 mm long; ovary with Type 2 hairs only; functional style 4–4.5 mm long, erect, with Type 2 hairs only. *Fruiting calyx* with lobes less than or more than half length of mature fruit. Mature fruits 1 per inflorescence, globular, *c.* 15 mm diameter, green, 2-locular; placenta in cross-section sessile, semi-circular; mesocarp moist but not juicy; exocarp 0.8–1.3 mm thick; pedicels 12–18 mm long in fruit, 0.9–1.5 mm thick at mid-point; seeds pale yellow, 3.8–4 mm long. **Fig. 6, 26.**

***Specimens examined*: Queensland.** LEICHHARDT DISTRICT: Junee Tableland, N of Dingo, Nov 1990, *Bean* 2604 (BRI); near eastern road, Junee Tableland, N of Dingo, Oct 2002, *Bean* 19399 (BRI); eastern edge of S.F.236, SW of Blackwater, Nov 2002, *Bean* 19519 (BRI, MEL); ditto, *Bean* 19525 (BRI); S of Triumph Ck, *c.* 30 km SW of Blackwater, Nov 2002, *Bean* 19538 (BRI).

***Distribution and habitat*:** *Solanum pusillum* is endemic to Queensland. Known from two areas in the central east of the state (**Map 14**). It usually grows in shallow yellowish soil on the edges of low plateaux, where the dominant species may be *Acacia catenulata, Eucalyptus trachyphloia, E. tenuipes* or *E. exserta*.

***Phenology*:** Poorly known. Flowers and fruits are recorded for October and November.

***Notes*:** Closely related to *S. adenophorum*, but differing by having only stellate hairs on the

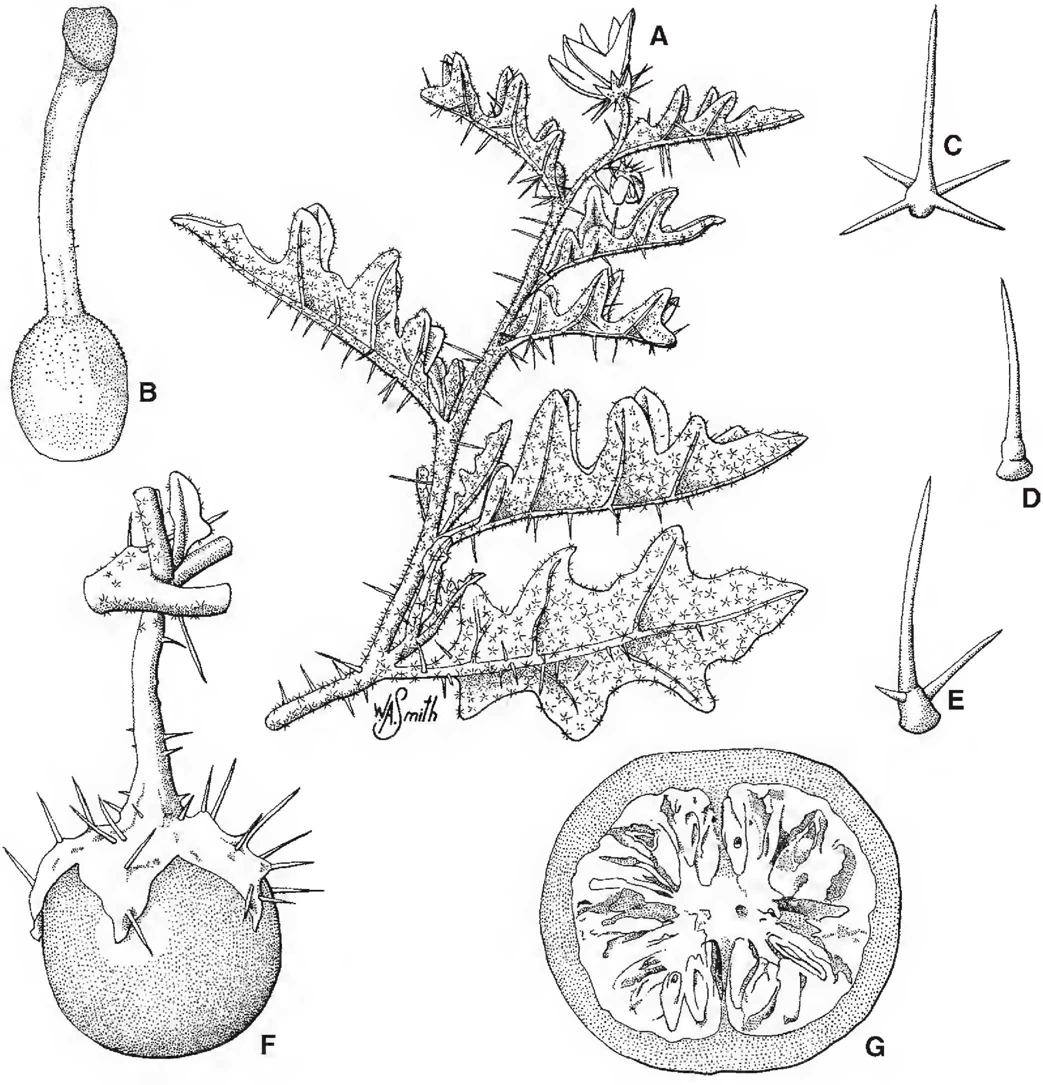


Fig. 26. ***Solanum pusillum***. A. flowering branchlet × 1. B. ovary and style × 9. C. stellate hair with 4 lateral rays, upper leaf surface × 30. D. finger hair, upper leaf surface × 30. E. stellate hair with 2 lateral rays, upper leaf surface × 30. F. mature fruit, calyx and pedicel × 2. G. transverse section of fruit × 3. all from *Bean* 19411.

branchlets and lower leaf surface, petioles 8–18% of lamina length (30–80% for *S. adenophorum*), presence of Type 2 hairs on the lower leaf surface and calyx, 1–3 flowered pseudo-umbellate inflorescence (4–8 flowered and pseudo-racemose for *S. adenophorum*) and style 4–4.5 mm long (6–7 mm for *S. adenophorum*).

Conservation status: *S. pusillum* is known to exist in 7 subpopulations, of which four are on the Junee Tableland. It does not occur in any conservation reserve. Applying the IUCN guidelines (IUCN. 2001), a category of "Near Threatened" is recommended.

Etymology: From the Latin *pusillus* meaning tiny or puny, a reference to the small size of the plant.

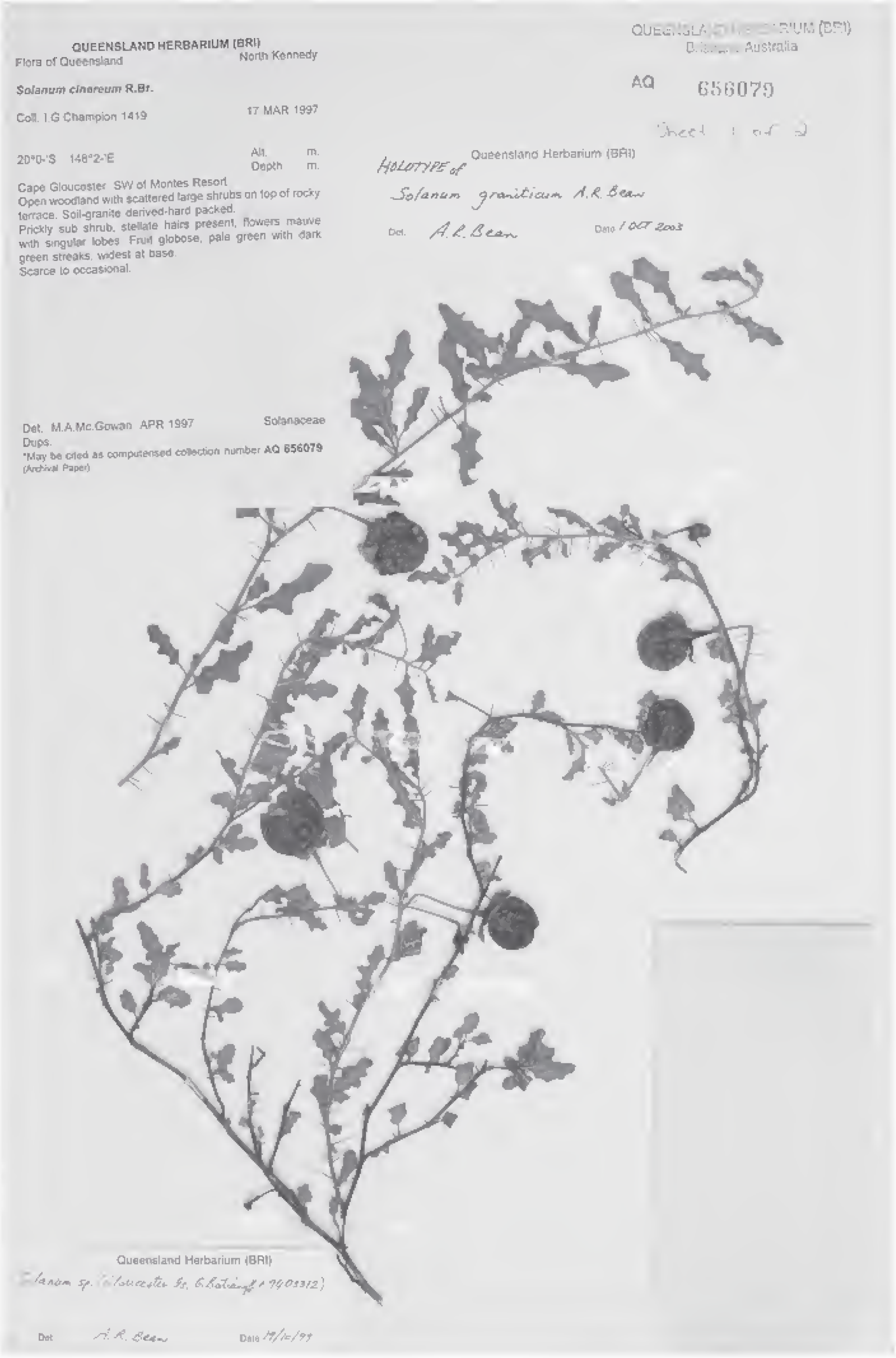
41. Solanum graniticum A.R.Bean **sp. nov.** Repullulator herbaceus prostratus vel fusus; aculei in ramulis praesentes; folia adulta 1.2–2.6 cm longa, profunde vel non profunde lobata, stellis in pagina inferiore sparse praeditis; inflorescentia 1 vel 2-flora, pedunculo communi 0–1 mm longo; pedicelli sub anthesi 9–15 mm longi; calyx aculeis 18–50 praeditus; corolla malvina, non profunde lobata; fructus maturitate virides. **Typus:** Queensland. North Kennedy District: Cape Gloucester, SW of Montes Resort, 17 March 1997, *I.G. Champion* 1419 (holo: BRI; iso: MEL).

Solanum sp. (Gloucester Island G.N. Batianoff+ 9403312) in Henderson (2002).

Prostrate or sprawling, herbaceous resprouter, 0.15–0.3 m high. Juvenile stage absent. Adult branchlets yellow or brown; prickles 10–45 per decimetre, straight, acicular, 2.5–9 mm long, 10–16 times longer than wide; stellae dense, 0.25–0.5 mm diameter, sessile; lateral rays 7 or 8, porrect; central ray 0.3–0.7 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Adult leaves* elliptical or ovate, shallowly to deeply lobed throughout; lobes 2 or 3 on each side, obtuse, lobing index 1.5–3; lamina 1.2–2.6 cm long, 0.6–1.3 cm wide, 1.6–2.4 times longer than broad, apex obtuse, base cuneate, oblique part 0–1 mm long, obliqueness index 0–4 percent; petioles 0.15–0.45 cm long, 13–22% length of lamina, prickles absent. *Upper leaf surface* green; prickles 1–3, straight, acicular, 1–5 mm long, prickles present on midvein only; stellate hairs confined to midrib, or distributed throughout; protostellae absent; ordinary stellae very sparse to sparse, 0.3–1 mm apart, 0.1–0.3 mm across, sessile; lateral rays 5–8, porrect; central ray 0.5–1 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Lower leaf surface* green; prickles 0–2, straight, acicular, absent or present on midvein only; stellae sparse to moderate, 0.4–0.7 mm apart, 0.25–0.4 mm diameter, sessile; lateral rays 7 or 8, porrect; central ray 0.5–1.2 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Inflorescence* leaf-opposed or supra-axillary, solitary or pseudo-umbellate, common peduncle 0–1 mm long; 1 or 2-flowered, strongly andromonoecious, flowers 5-merous; pedicels 9–15 mm long at anthesis, same thickness throughout, 0.4–0.6 mm thick at mid-point, prickles present. Calyx tube 2.5–3 mm long, lobes deltate or rostrate, 2–5.5 mm long; prickles present at anthesis, 18–50 per flower, 1.5–5 mm long; stellae moderate to dense, transparent, 0.2–0.3 mm across, sessile, lateral rays 6–8, central ray 0.5–1 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. Corolla mauve, 9–14 mm long, shallowly lobed, inner surface glabrous; anthers 3.5–4.5 mm long; ovary with Type 2 hairs only; functional style 5.5–8.5 mm long, erect, with Type 2 hairs only. *Fruiting calyx* with lobes less than or more than half length of mature fruit, prickles 2–5 mm long. Mature fruits 1 per inflorescence, globular, *c.* 15 mm diameter, green; mesocarp moist but not juicy; pedicels 15–27 mm long in fruit, 0.7–0.9 mm thick at mid-point; seeds pale yellow, 2.7–3.2 mm long. **Fig. 27.**

Specimens examined**: Queensland.** North Kennedy District: ridge 1 km S of Mt Bertha, Gloucester Island, Mar 1994, *Batianoff* 9403312 *et al.* (BRI); SE Point, above Chinaman Rock, Gloucester Island, May 1994, *Batianoff* 940592 & *Dillewaard* (BRI); *c.* 1.5 km due E of Nelly Bay, Mar 1999, *Kemp* TH347 & *Allison* (BRI). South Kennedy District: lookout at Eungella Dam, W of Eungella, Feb 2003, *Bean* 20061 & *Champion* (BRI).

Distribution and habitat: *Solanum graniticum* is endemic to Queensland. Found on Gloucester Island (near Bowen), and adjacent parts of the mainland, and with a disjunct occurrence at Eungella Dam (**Map 16**). It grows in open



QUEENSLAND HERBARIUM (BRI)
Flora of Queensland North Kennedy

Solanum cinereum R.Br.

Coll. I.G Champion 1419 17 MAR 1997

20°0-'S 146°2-'E Alt. m.
Depth m.

Cape Gloucester SW of Montes Resort
Open woodland with scattered large shrubs on top of rocky terrace. Soil-granite derived-hard packed.
Prickly sub shrub, stellate hairs present, flowers mauve with singular lobes Fruit globose, pale green with dark green streaks, widest at base.
Scarce to occasional.

Det. M.A.Mc.Gowan APR 1997 Solanaceae
Dups.
*May be cited as computerised collection number AQ 656079
(Archival Paper)

QUEENSLAND HERBARIUM (BRI)
Brisbane Australia

AQ 656079

Sheet 1 of 2

Queensland Herbarium (BRI)
HOLOTYPE of
Solanum graniticum A.R.Bean
Det. A.R.Bean Date 1 OCT 2003

Queensland Herbarium (BRI)
Solanum sp. (Gloucester Is. G.Batianoff + 9403312)
Det A.R.Bean Date 19/10/99

Fig. 27. Holotype of ***Solanum graniticum***.

eucalypt woodland on hillsides with shallow soil derived from granite or granodiorite.

***Phenology*:** Flowers are recorded for March; mature fruits for March and May.

***Notes*:** *S. graniticum* is closely related to *S. pusillum*, but *S. graniticum* differs by the relatively small leaves, petioles without wings, the lack of finger hairs and Type 2 hairs, the smaller stellae on all plant parts, the mauve, shallowly-lobed corolla, and the longer pedicels.

***Conservation status*:** *S. graniticum* is known from 4 locations, 3 of them in close proximity. It occurs in the Gloucester Island N.P.. Most populations are threatened by road and housing construction, weeds, and grazing. Applying the IUCN guidelines (IUCN. 2001), a category of "Endangered" is recommended (EN B1ab(ii,iii,v)+2ab(ii,iii,v); C1+2a(i)).

***Etymology*:** The epithet refers to the granite substrate where this species is found.

42. Solanum stenopterum A.R.Bean **sp. nov.** Repullulator herbaceus; folia adulta lobata vel integra utrinque viridia; petioli alati; stellae in pagina superiore folii radiis lateralibus 3–5 et radio centrali comparate longo praeditae; inflorescentia 1 vel 2-flora pedunculo communi carens; pedicelli 21–28 mm longi; aculei calycis praesentes; corolla purpurea. **Typus:** Queensland. DARLING DOWNS DISTRICT: Warrego Highway, 10 km NW of Oakey, 13 December 2001, *A.R. Bean* 18190 (holo: BRI (1 sheet + spirit); iso: AD, CANB, MEL, NSW).

Solanum sp. (Dalby R.F. Kelsey 56) in Henderson (2002).

Sprawling or erect, herbaceous resprouter, 0.2–0.4 m high. Juvenile stage absent. Adult branchlets green; prickles 7–15 per decimetre, straight, acicular, 2–8 mm long, 10–15 times longer than wide; stellae sparse, 0.4–1.2 mm diameter, sessile; lateral rays 4–8, porrect; central ray 0.7–1.4 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Adult leaves* linear to ovate, entire or shallowly to deeply lobed throughout; lobes 2 or 3 on each side, acute or obtuse, lobing index 1–5; lamina 4–7 cm long, 0.5–2.6 cm wide, 2.2–12 times longer than broad, apex acute, base cuneate, oblique part 0–3 mm long, obliqueness index 0–5 percent; petioles 0.5–1.3 cm long, 10–18% length of lamina, winged, prickles absent. *Upper leaf surface* green; prickles 3–15, straight, acicular, 1–4 mm long, prickles present on midvein only or present on midvein and lateral veins; stellate hairs confined to midrib, or distributed throughout; protostellae absent; ordinary stellae very sparse to moderate density, 0.8–2.5 mm apart, 0.3–1.1 mm across, sessile; lateral rays 3–5, porrect; central ray 1–3 times as long as laterals, not gland-tipped; finger hairs absent or present, 1–3 mm apart, not gland-tipped, 0.6–1.2 mm long; Type 2 hairs absent. *Lower leaf surface* green; prickles 1–15, straight, acicular, present on midvein only or present on midvein and lateral veins; stellae very sparse to moderate, 0.8–3 mm apart, 0.5–1 mm diameter, sessile; lateral rays 4–7, porrect; central ray 1–2 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Inflorescence* leaf-opposed, solitary or pseudo-umbellate, common peduncle absent; 1 or 2-flowered, strongly or weakly andromonoecious, flowers 5-merous; pedicels 21–38 mm long at anthesis, same thickness throughout, 0.5–0.7 mm thick at mid-point, prickles absent or present. Calyx tube 2–3 mm long, lobes deltate, 1.5–2.5 mm long; prickles present at anthesis, 5–40 per flower, 1–4 mm long; stellae sparse to dense, transparent, 0.3–0.6 mm across, sessile, lateral rays 2–6, central ray 1–3 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. Corolla purple, 14–18 mm long, shallowly lobed, inner surface glabrous; anthers 3.5–5 mm long; ovary with Type 2 hairs only; functional style 7.5–8.5 mm long, erect, glabrous or with Type 2 hairs only. *Fruiting calyx* with lobes more than half length of mature fruit, prickles 2–4 mm long. Mature fruits 1 per inflorescence, globular, *c.* 10 mm diameter; pedicels 21–38 mm long in fruit, *c.* 1.5 mm thick at mid-point. **Fig. 28.**

Specimens examined: **Queensland.** BURNETT DISTRICT: *c.* 64 miles [103 km] WSW of Gayndah, Oct 1969, *McPherson* (BRI). DARLING DOWNS DISTRICT: *c.* 5 km SW of Dalby, Mar 1958, *Kelsey* 56 (BRI); Condamine River, 4–5 miles [6–8 km] S of Dalby, Sep 1958, *Kelsey* 64 (BRI); 'Burradoo', 50 km NE of Goondiwindi, Mar 1979, *Lahey* (BRI); Myall Park,

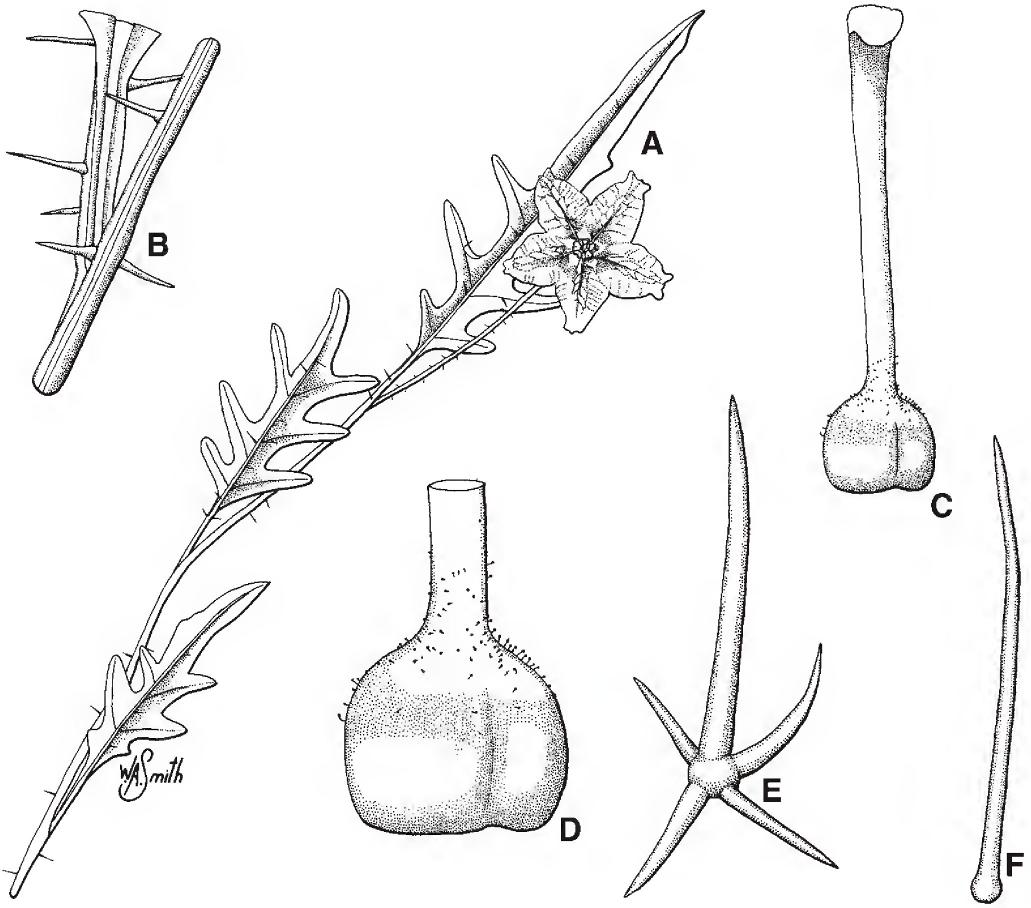


Fig. 28. ***Solanum stenopterum***. A. flowering branchlet × 0.8. B. base of leaf showing winged petiole × 3. C. ovary and style × 6. D. ovary with Type 2 hairs × 12. E. stellate hair with 4 lateral rays, upper leaf surface × 60. F. finger hair, upper leaf surface × 60. all from *Bean* 18190.

Glenmorgan, Dec 1984, *Gordon* 8887 (AD, BRI, CANB); 6 km SE of Cecil Plains, Feb 1995, *Fensham* 2012 (BRI); Warrego Highway, *c.* 7 km W of Jackson, Jan 2000, *McDonald* KRM262 (BRI); SE corner of Oakey Army Airfield, Dec 2001, *Menkins* ILM76 (BRI); 4 km E of Cecil Plains, Jan 2002, *Franzmann* 66 (BRI). **New South Wales.** NORTH WEST SLOPES: Ashford, Mar 1908, *Hayes s.n.* (NSW).

***Distribution and habitat*:** In Queensland, *Solanum stenopterum* extends from Gayndah to Moonie, and west to Glenmorgan and Yuleba (**Map 15**), and there is an old collection from Ashford in New South Wales. It inhabits grassland, Belah forest or *Eucalyptus populnea* woodland, on clayey soil.

***Phenology*:** Flowers are recorded from October to March; mature fruits recorded for March.

***Notes*:** *S. stenopterum* differs from *S. lacunarium* by the more sparsely distributed, longer and more acicular prickles; smaller leaf lobing index (sometimes entire); stellae very sparse to moderate on lower leaf surface (*vs.* very dense for *S. lacunarium*); stellae consistently with 3–5 lateral rays on upper leaf surface (*vs.* 7–10 lateral rays for *S. lacunarium*); central ray relatively long; inflorescences comprising 1 or 2 flowers and common peduncle absent (*vs.* 5–7 flowers, common peduncle 26–46 mm long for *S. lacunarium*).

In *S. stenopterum*, the style extends further beyond the anthers than in most other species. It very rarely sets fruit (pers. obs.; I. Menkins pers. comm.). Only 2 fruits are present in the collections at BRI, and both of these are insect damaged.

***Conservation status*:** Currently listed as "Vulnerable" under the *Queensland Nature Conservation Act 1992.*

Solanum stenopterum is known from 5 locations, none of which is protected within a conservation reserve. It is threatened by land clearance, agricultural practices, weed encroachment, and mowing of road reserves, where most of the existing stands are located. Applying the IUCN guidelines (IUCN. 2001), a category of "Endangered" is recommended (EN A3ce; B2ab(ii,iii,v)).

***Etymology*:** From the Greek *stenos* meaning 'narrow' and *pteron* meaning 'wing'. This is in reference to the proximal extension of the leaf lamina resulting in a winged petiole.

43. Solanum lacunarium F.Muell., Trans. Philos. Soc. Victoria 1: 18 (1854). **Type:** near the junction of the rivers Darling and Murray, December 1853, *F. Mueller* (lecto: MEL [MEL11745]), *fide* Symon (1981).

***Illustration*:** Cunningham *et al.* (1981: 593); Symon (1981: 185).

Prostrate or sprawling, herbaceous resprouter, 0.2–0.4 m high. Juvenile stage absent. Adult branchlets grey or brown; prickles 5–35 per decimetre, straight, acicular or broad-based, 0.5–5 mm long, 5–9 times longer than wide; stellae sparse, 0.25–0.3 mm diameter, sessile; lateral rays 8–9, porrect; central ray absent; finger hairs absent; Type 2 hairs absent. *Adult leaves* elliptical or ovate, deeply lobed throughout; lobes 3–5 on each side, obtuse, lobing index 5–12; lamina 2.5–6.5 cm long, 1.3–3.5 cm wide, 1.8–2.2 times longer than broad, apex obtuse, base cuneate or obtuse, oblique part 0–2 mm long, obliqueness index 0–4 percent; petioles 0.9–3.2 cm long, 35–55% length of lamina, winged, prickles present. *Upper leaf surface* green; prickles 35–50, straight, broad-based, 1–4 mm long, prickles present on midvein and lateral veins; stellate hairs distributed throughout; protostellae absent; ordinary stellae very sparse, 0.4–1.3 mm apart, 0.2–0.3 mm across, sessile; lateral rays 7–10, porrect; central ray 0–0.5 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Lower leaf surface* white; prickles 6–20, straight, broad-based, prickles present on midvein only or present on midvein and lateral veins; stellae very dense, 0.05–0.1 mm apart, 0.3–0.4 mm diameter, sessile; lateral rays 8–9, porrect; central ray 0–0.4 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Inflorescence* supra-axillary, pseudo-racemose, common peduncle 26–46 mm long, rachis prickles present; 5–7-flowered, weakly andromonoecious, flowers 5-merous; pedicels 7–18 mm long at anthesis, same thickness throughout, 0.4–0.8 mm thick at mid-point, prickles absent or present. Calyx tube 1.5–2.5 mm long, lobes deltate, 1–2 mm long; prickles present at anthesis, 15–25 per flower, 0.5–3 mm long; stellae moderate to dense, white, 0.2–0.3 mm across, sessile, lateral rays 7 or 8, central ray 0–0.4 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. Corolla mauve or purple, 8–10 mm long, rotate, inner surface glabrous; anthers 3.5–4.5 mm long; ovary with stellate hairs only; functional style 5–7.5 mm long, erect, with stellate and Type 2 hairs, stellae 0.25–0.35 mm across, lateral rays 4–8, central ray 0–0.4 times as long as laterals. *Fruiting calyx* with lobes less than half length of mature fruit, prickles 1–3 mm long. Mature fruits 1–3 per inflorescence, globular or ellipsoidal, 12–15 mm diameter; pedicels 14–21 mm long in fruit, 0.9–1.1 mm thick at mid-point. *Lagoon Nightshade.*

***Specimens examined*:** **Queensland.** MARANOA DISTRICT: Dirranbandi, *anno* 2000, *Christodoulou* (BRI). **New South Wales.** NORTH FAR WESTERN PLAINS: Arrara–Lake Eliza, Oct 1912, *Boorman s.n.* (NSW); Gidgee Tank, Mount Wood, Tibooburra, Oct 1949, *Constable* 10489 (NSW); floodplain of Cuttaburra Channels, 35 km NE of Yantabulla, Nov 1979, *Paijmans* 3282 (CANB).

***Distribution and habitat*:** In Queensland, *Solanum lacunarium* is known from a single collection near Dirranbandi (**Map 15**). It occurs widely in semi-arid parts of New South Wales, Victoria and South Australia. The Queensland record was from a grassy plain with Mitchell Grass (*Astrebla* spp.) and scattered *Eucalyptus coolabah.*

***Phenology*:** Flowers and fruits are recorded for January and October.

***Notes*:** The bright orange prickles borne on the branchlets and both leaf surfaces of *S. lacunarium* are distinctive.

Its habitat is similar to that of *S. stenopterum*, but *S. lacunarium* occurs in areas of much lower rainfall.

***Conservation status*:** Not considered at risk in an Australian context, although its occurrence in Queensland is probably very limited.

Group 25B (S. pugiunculiferum group), here defined; related to Group 25 (*S. hystrix* group) of Whalen (1984)

Large stems hollow; stellate and finger hairs absent; prickles straight, broad-based; adult leaves deeply lobed, obliqueness index 15–24%; prickles present on both leaf surfaces; corolla 4–5 mm long; anthers 1.5–2.5 mm long; calyx with 0–4 prickles; mesocarp dry in mature fruits.

1 species endemic to Australia, and indigenous to Queensland.

44. Solanum pugiunculiferum C.T.White, Proc. Roy. Soc. Queensland 53: 225 (1942). **Type:** Queensland. Burke District: Settlement Creek, November 1922, *L.J. Brass* 244 (holo: BRI).

***Illustration*:** Symon (1981: 100)

Prostrate or sprawling, herbaceous resprouter, 0.2–0.6 m high. Juvenile stage absent. Adult branchlets grey, yellow or brown; prickles 10–200 per decimetre, straight, acicular or broad-based, 2–16 mm long, 6–8 times longer than wide; stellae absent; finger hairs absent; Type 2 hairs absent, or sparse. *Adult leaves* elliptical or ovate, deeply lobed throughout; lobes 2 or 3 on each side, acute, lobing index 2.3–10; lamina 1.6–4.5 cm long, 1.1–2.8 cm wide, 1.4–1.7 times longer than broad, apex acute, base obtuse or cordate, oblique part 0.5–11 mm long, obliqueness index 2–24 percent; petioles 0.5–1 cm long, 20–30% length of lamina, prickles absent or present. *Upper leaf surface* green or grey-green; prickles 3–10, straight, broad-based, 1–17 mm long, prickles present on midvein only or present on midvein and lateral veins; stellate hairs absent; finger hairs absent; Type 2 hairs present only in vein depressions. *Lower leaf surface* green; prickles 2–8, straight, broad-based, prickles present on midvein only or present on midvein and lateral veins; stellae absent; finger hairs absent; Type 2 hairs absent. *Inflorescence* supra-axillary, pseudo-racemose, common peduncle 2–4 mm long, rachis prickles present; 2–5-flowered, with all flowers bisexual and 5-merous; pedicels 3–5 mm long at anthesis, same thickness throughout, 0.4–0.6 mm thick at mid-point, prickles absent or present. Calyx tube 1–1.5 mm long, lobes deltate, 0.5–1 mm long; prickles present at anthesis, 1–4 per flower, 2–6 mm long; stellae absent; finger hairs absent; Type 2 hairs absent. Corolla mauve, 4–5 mm long, rotate, inner surface glabrous; anthers 1.5–2.5 mm long; ovary glabrous; functional style 2.5–3.5 mm long, erect, glabrous. *Fruiting calyx* with lobes less than half length of mature fruit, prickles present, 2.5–9 mm long. Mature fruits 1–4 per inflorescence, globular, 8–11 mm diameter, brown or yellow; mesocarp dry; pedicels 5–8 mm long in fruit, 0.7–1 mm thick at mid-point; seeds pale yellow, 3–3.8 mm long.

***Specimens examined*:** **Northern Territory.** Red Lily Lagoon, 8 miles [13 km] E of 'Elsey' HS, Oct 1958, *Chippendale* 5064 (BRI); 3 km E of 'Bing Bong' HS, Sep 1985, *Latz* 10243 (BRI). **Queensland.** Burke District: Burketown, May 1919, *Higgins* (BRI); Normanton, May 1935, *Blake* 8989 (BRI); Karumba, Jun 1966, *Pedley* 2103 (BRI); 6 miles [10 km] SE of Burketown, Jun 1967, *Symon* 4998 (BRI); 1.6 km SW of Burketown, Jul 1974, *Ollerenshaw & Kratzing* 1373 (BRI, CANB); Denham Island, north end, just W of Mornington Island, Sep 1981, *Fosberg* 62034 (CANB); 32 km NNE of 'Inverleigh' HS, duckhole, Jul 1987, *Dalliston* HC137 (BRI); Karumba, Sep 1998, *Gunther* MG107 (BRI). Cook District: Mapoon, N of Weipa, Sep 1980, *Godwin* A55 (BRI); *c.* 7 km N of 'Inkerman' HS, Jun 1990, *Neldner* 2917 & *Clarkson* (AD, BRI, NSW, QRS); road from Kowanyama to 'Topsy', *c.* 16 km from 'Topsy', Oct 1999, *Thomas* & *Lansdown* (BRI).

***Distribution and habitat*:** In Queensland, *Solanum pugiunculiferum* is found around the Gulf of Carpentaria (**Map 13**), but it also occurs in Northern Territory and the Kimberley of Western Australia. It grows near the coast on heavy clay soils, sometimes in areas that are periodically flooded by very high tides. In the latter situation, it is associated with *Sporobolus virginicus* grassland.

***Phenology*:** Flowers recorded from May to September; mature fruits from May to October, plus a single record in January.

Notes: *Solanum pugiunculiferum* is a highly distinctive species, worthy of the monotypic sectional status accorded it by Symon (1981). It is totally without stellate hairs or finger hairs, it has hollow stems, very oblique leaf bases, tiny flowers (corolla 4–5 mm long) with disproportionately long filaments, and fruits that are quite dry at maturity. The often saline habitat is also very unusual for a *Solanum.*

Solanum oligandrum Symon, recently described from tropical Western Australia (Symon 2001) does not appear to be particularly closely related to *S. pugiunculiferum.*

White (1942) cited two collections in the protologue, without any indication of a type. However, on the Brass 244 sheet, he has written "Solanum pugiunculiferum C.T.White, Type". Hence the choice of a lectotype is unnecessary.

Conservation status: Moderately widespread. Not considered at risk.

Group 27 (**S. ellipticum group**) of Whalen (1984)

Calyx prickly, not accrescent in fruit (100%); corolla shallowly to deeply lobed (100%); inflorescences andromonoecious, male flowers and bisexual flowers same size and prickliness (100%); branchlet stellae dense to very dense (100%); fruits green to yellowish-green, mesocarp moist but not succulent (100%); branchlets prickly (87%); adult leaves entire (87%); upper leaf suface with dense to very dense stellate hairs (71%).

10 species endemic to Australia; 8 species indigenous to Queensland.

45. Solanum ellipticum R.Br., Prodr. 446 (1810). *S. ellipticum* var. *ellipticum* Benth. Fl. Austral. 4: 464 (1868); *S. ellipticum* f. *ellipticum* Wawra, Itin. Princ. S. Coburgi 100 (1883); *S. ellipticum* var. *typicum* Domin, Biblioth. Bot. 89: 588 (1929), *nom. inval.* **Type:** [Queensland. PORT CURTIS DISTRICT:] "Broadsound", 25 September 1802, *R. Brown* (lecto: BM; isolecto: MPU).

Solanum ellipticum var. *chillagoense* Domin, Biblioth. Bot. 89: 588 (1929). **Type:** Queensland. COOK DISTRICT: near Chillagoe, February 1910, *K. Domin* (syn: PR [2 collections], photos at BRI).

Solanum ellipticum f. *albiflora* Domin, Biblioth. Bot. 89: 588 (1929). **Type:** Queensland. COOK DISTRICT: near Chillagoe, February 1910, *K. Domin* (holo: PR?).

Solanum cleistogamum Symon, Trans. & Proc. Roy. Soc. South Australia 95: 227 (1971), **syn. nov. Type:** Western Australia. 20 miles [32 km] north of Onslow, 1 July 1967, *D.E. Symon* 5418 (holo: PERTH; iso: AD, CANB, K, L).

Solanum sp. (Newcastle Range D.E. Symon 4907) in Henderson (2002).

[*S. dianthophorum auct., non* Dunal]

Illustration: Cunningham *et al.* (1981: 592); Symon (1981: 192), as *S. dianthophorum.*

Prostrate, herbaceous resprouter or rhizomatous perennial shrub, 0.1–0.3 m high. Juvenile stage absent. Adult branchlets white to mauve or brown; prickles 10–250 per decimetre, straight, acicular, 1–8 mm long, 7–15 times longer than wide; stellae dense to very dense, 0.5–0.8 mm diameter, stalks 0–0.3 mm long; lateral rays 7–12, porrect or ascending; central ray 0.5–1 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Adult leaves* elliptical or ovate, entire; lamina 3.5–14 cm long, 1.5–5.2 cm wide, 1.7–2.9 times longer than broad, apex obtuse or acute, base cuneate or obtuse or cordate, oblique part 0–9 mm long, obliqueness index 0–6 percent; petioles 0.8–4.6 cm long, 20–65% length of lamina, prickles present. *Upper leaf surface* grey-green or grey; prickles 2–20, straight, acicular, 1–7 mm long, prickles present on midvein only or present on midvein and lateral veins; stellate hairs distributed throughout; protostellae absent; ordinary stellae density moderate to very dense, 0.1–0.5 mm apart, 0.4–0.7 mm across, stalks 0–0.3 mm long; lateral rays 7 or 8, porrect; central ray 0.5–1 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Lower leaf surface* white or yellowish; prickles 0–40, straight, acicular, absent or present on midvein only or present on midvein and lateral veins; stellae dense to very dense, 0.05–0.3 mm apart, 0.5–0.8 mm diameter, stalks 0–0.4 mm long; lateral rays 7 or 8, porrect; central ray 0.5–1 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Inflorescence* supra-axillary, solitary or pseudo-racemose, common peduncle 0–40 mm long, rachis prickles present; 1–9-flowered, weakly andromonoecious or with all flowers bisexual, flowers 5-merous; pedicels 4–16 mm long at anthesis, same thickness throughout, 0.7–0.9 mm thick at mid-point, prickles absent or present. Calyx tube 1.5–3 mm long, lobes deltate or attenuate, 2–10 mm long; prickles present at anthesis, 5–50 per flower, 1–5 mm long; stellae very dense, white to brown, 0.4–1 mm across, stalks 0–0.4 mm long, lateral rays 7 or 8, central ray 0.8–1 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. Corolla white, mauve or purple, 5–12 mm long, shallowly or deeply lobed, inner surface glabrous or sparsely stellate-hairy; anthers 3–6 mm long; ovary glabrous, or with Type 2 hairs only; functional style 5.5–10 mm long, erect or sigmoid, glabrous or with Type 2 hairs only. *Fruiting calyx* with lobes less than or more than half length of mature fruit, prickles 1–5 mm long. Mature fruits 1–5 per inflorescence, globular, 13–17 mm diameter, yellowish-green or green, 2- or 4-locular; placenta in cross-section stalked, anvil-shaped; mesocarp moist but not juicy; exocarp 0.6–2.1 mm thick; pedicels 7–19 mm long in fruit, 0.8–2.1 mm thick at mid-point; seeds pale yellow, 2.2–2.7 mm long.

***Selected specimens*: Queensland.** COOK DISTRICT: Guguyalangi Gallery, 13 km S of Laura on the Peninsula Development road, Jun 1981, *Clarkson* 3669 (AD, BRI, PERTH, QRS); Royal Arch cave, Chillagoe N.P., Mar 2000, *McDonald* KRM337 (BRI). NORTH KENNEDY DISTRICT: Mt Remarkable, near Pentland, Jun 1934, *Blake* 6124 (BRI); S side of Red Falls road, 42 km NW of Charters Towers, Jul 1989, *Jobson* 672 (BRI, MEL). GREGORY NORTH DISTRICT: 'Kamaran Downs', 10 km NNW of Bedourie, Jun 1995, *Edmunds* 23 (BRI). MITCHELL DISTRICT: 61 km E of Barcaldine on road to Jericho, Oct 1993, *Lepschi* & *Slee* 1173 (AD, BRI, CANB); 4 km SE of 'Lake Dunn' HS, NE of Aramac, Feb 1994, *Bean* 7504 & *Forster* (AD, BRI, DNA). SOUTH KENNEDY DISTRICT: 13 miles [21 km] SW of 'Alpha' station, Oct 1964, *Adams* 1339 (BRI, CANB); 11 km NW of Belyando Crossing on edge of Gregory Development road, Jun 1992, *Thompson* BUC818 & *Sharpe* (AD, BRI). LEICHHARDT DISTRICT: 'Pamaroo', 25 miles [40 km] SE of Injune, Apr 1961, *Johnson* 2129 (BRI); 'Wandobah', *c.* 1 km NE of Dingo, Jul 1988, *Anderson* 4492 (BRI). PORT CURTIS DISTRICT: Orange Creek, *c.* 20 miles [32 km] NW of Biloela, Jun 1959, *Johnson* 857 (BRI); 4 km WSW of St Lawrence, Apr 2000, *Bean* 16250 (BRI, MEL). GREGORY SOUTH DISTRICT: 10 miles [16 km] W of Betoota, Jul 1936, *Blake* 12184 (BRI). WARREGO DISTRICT: *c.* 11 km SW of Thargomindah, on road to Hungerford, Sep 1973, *Henderson* H2061 & *Boyland* (AD, BRI); 0.4 km W of Gee Gee Gap, Mt Moffatt N.P., Dec 1997, *Bean* 12905 (BRI). MARANOA DISTRICT: *c.* 41 km along Shirlo road, NW of Bollon, Mar 2001, *Bean* 17543 (BRI). BURNETT DISTRICT: 'Neaavie', NE of homestead towards Barambah Creek, Aug 1996, *Grimshaw* PG2536 & *Turpin* (BRI); *c.* 6 km NE of Allies Creek and 7.5 km SW of 'Weir Weir', Jul 1998, *Pollock* ABP617 & *Dean* (BRI). WIDE BAY DISTRICT: Bingera, Dec 1896, *J.F. Bailey* (BRI). DARLING DOWNS DISTRICT: 8 km WSW of Oakey, Apr 1994, *Fensham* 1444 (BRI); 14 km N of Goondiwindi, towards Moonie, Feb 1996, *Bean* 9907 (BRI, MEL, NSW). MORETON DISTRICT: Gatton, Nov 1916, *Bick s.n.* (BRI); 2 km ESE of Laidley, Jun 2002, *Bean* 19062 (BRI). **New South Wales.** NORTH WEST PLAINS: 4 km SSW of 'The Glen' HS, *c.* 70 km W of Moree, Jan 1999, *Wannan* 1036 *et al.* (AD, BRI, NSW). NORTH FAR WESTERN PLAINS: Urisino–Yamba station road, 30 miles [48 km] W of Wanaaring, Oct 1963, *Constable* 4583 (BRI, NSW); Golden Gully mining site, adjacent to Deadhorse Gully camping area, 1 km N of Tibooburra, Sturt N.P., Sep 1989, *Coveny* 13598 *et al.* (AD, BRI, MO, NSW).

***Distribution and habitat*:** *Solanum ellipticum* occurs throughout Queensland, except for the north-west, Cape York Peninsula and much of the east coast (**Map 18**). It inhabits eucalypt woodlands, Lancewood communities, semi-evergreen vine thicket and Mulga woodlands. Soils vary greatly from sands to heavy clays.

***Phenology*:** Flowers and fruits are recorded for every month of the year.

Notes: On the date of collection of the type of *Solanum ellipticum*, Robert Brown was botanising near the mouth of the Styx River, ESE of St Lawrence (Vallance *et al.* 2001).

S. ellipticum is probably the most taxonomically difficult species in Australia. It is common and widespread, but also highly variable. There are some (ill-defined) geographical variants, while plants growing side by side in natural habitat can be quite different in morphology *e.g.* prickliness, leaf colour, flower colour, indumentum density. Symon (1981) highlighted its taxonomic difficulties, and my own efforts to classify its variation have largely failed.

Specimens of *S. cleistogamum* (including the holotype) borrowed from PERTH are a very good match for material found in eastern Queensland, where the type of *S. ellipticum* was collected, and I do not think it is possible to maintain the former as a distinct taxon. The Western Australian specimens do generally have longer, consistently glabrous prickles, long petioles and leaves with an obtuse apex, but there is no qualitative difference. The perceived cleistogamous habit was apparently a major factor in Symon's decision to name *S. cleistogamum*. However, the occurrence of cleistogamy does not seem sufficient to warrant the recognition of a separate species. It is very difficult to assess the degree of cleistogamy in any specimen in the herbarium, nor is it easy in the field. Perhaps cleistogamy occurs throughout the range of *S. ellipticum*, and indeed I have observed it on occasion for *S. ellipticum* in Queensland. The other key morphological characters given by Symon (1981: 34) for *S. cleistogamum* (stems sprawling; corolla 1–1.5 cm diameter; mature berry pale yellow-green or slightly purplish) apply equally well to *S. ellipticum* from around its type locality. The alternative statement (which eventually leads to *S. ellipticum* in the key) starts with "stems erect", but *S. ellipticum* is always prostrate or procumbent.

***Conservation status*:** Widespread. Not considered at risk.

46. Solanum dianthophorum Dunal, Hist. Nat. Solanum 183 (1813), *nom. nov.; S. biflorum* R.Br., Prodr. 445 (1810), *nom. illeg., non* Lour. (1790). **Type:** [Queensland. PORT CURTIS DISTRICT:] "Port II", undated [Port Clinton, 21–23 August 1802], *R. Brown* (holo: BM [Bennett No. 2668]).

Prostrate? shrub. Juvenile stage unknown. Adult branchlets rusty or brown; prickles absent; stellae very dense, 0.4–0.5 mm diameter, stalks 0–0.1 mm long; lateral rays 8–13, porrect; central ray 0.5–1 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Adult leaves* ovate, entire; lamina 1.5–3.5 cm long, 0.9–1.8 cm wide, 1.9–2.4 times longer than broad, apex obtuse or acute, base obtuse or cordate, oblique part 0–1.5 mm long, obliqueness index 0–4 percent; petioles 0.4–0.85 cm long, 20–25% length of lamina, prickles absent. *Upper leaf surface* grey-green; prickles 0–2, straight, acicular, 0.5–1.5 mm long, prickles absent or present on midvein only; stellate hairs distributed throughout; protostellae absent; ordinary stellae dense, 0.1–0.2 mm apart, 0.3–0.4 mm across, sessile; lateral rays 8, porrect; central ray 0.5–1 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Lower leaf surface* yellowish; prickles absent; stellae very dense, 0.05–0.15 mm apart, 0.3–0.4 mm diameter, stalks 0–0.1 mm long; lateral rays 8, porrect; central ray 0.5–1 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Inflorescence* supra-axillary, pseudo-racemose, common peduncle absent, rachis prickles absent; 2–4-flowered, flowers 5-merous; pedicels 4–5 mm long at anthesis, same thickness throughout, *c.* 0.5 mm thick at mid-point, prickles absent. Calyx tube *c.* 1.5 mm long, lobes attenuate, *c.* 3 mm long; prickles present at anthesis, 1–4 per flower, 0.5 mm long; stellae very dense, brown or rusty, 0.3–0.45 mm across, stalks 0–0.1 mm long, lateral rays 8, central ray 0.6–1 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. Corolla *c.* 7 mm long, deeply lobed, inner surface glabrous; anthers *c.* 3.9 mm long. *Fruiting calyx* with lobes less than half length of mature fruit, prickles present, 0.5–1 mm long. Mature fruits 1 per inflorescence, globular, 9–10 mm diameter (maturity unknown); pedicels 7–12 mm long in fruit, 0.9–1.2 mm thick at mid-point. **Fig. 29.**

***Specimens examined*:** known only from the type.

***Distribution and habitat*:** The type collection of *Solanum dianthophorum* was from Port Clinton, now part of the Shoalwater Bay Military Reserve, N of Rockhampton (**Map 16**). Brown, on the specimen label, recorded the habitat as "*arenosus prope littus*" (sandy area near beach).

***Phenology*:** Brown's collection, made in the month of August, bears flowers and fruits, but the state of maturity of the fruits is unknown.

***Notes*:** The type of *S. biflorum* R.Br. (on which *S. dianthophorum* is based) differs from the hundreds of available *S. ellipticum* specimens in several respects. These differences are: the smaller stellae on the branchlets, upper leaf surface and lower leaf surface; the leaves only 1.5–3.5 cm long (3.5–14 cm for *S. ellipticum*); the lack of prickles on the branchlets and petioles; the shorter petioles; and the calyx less

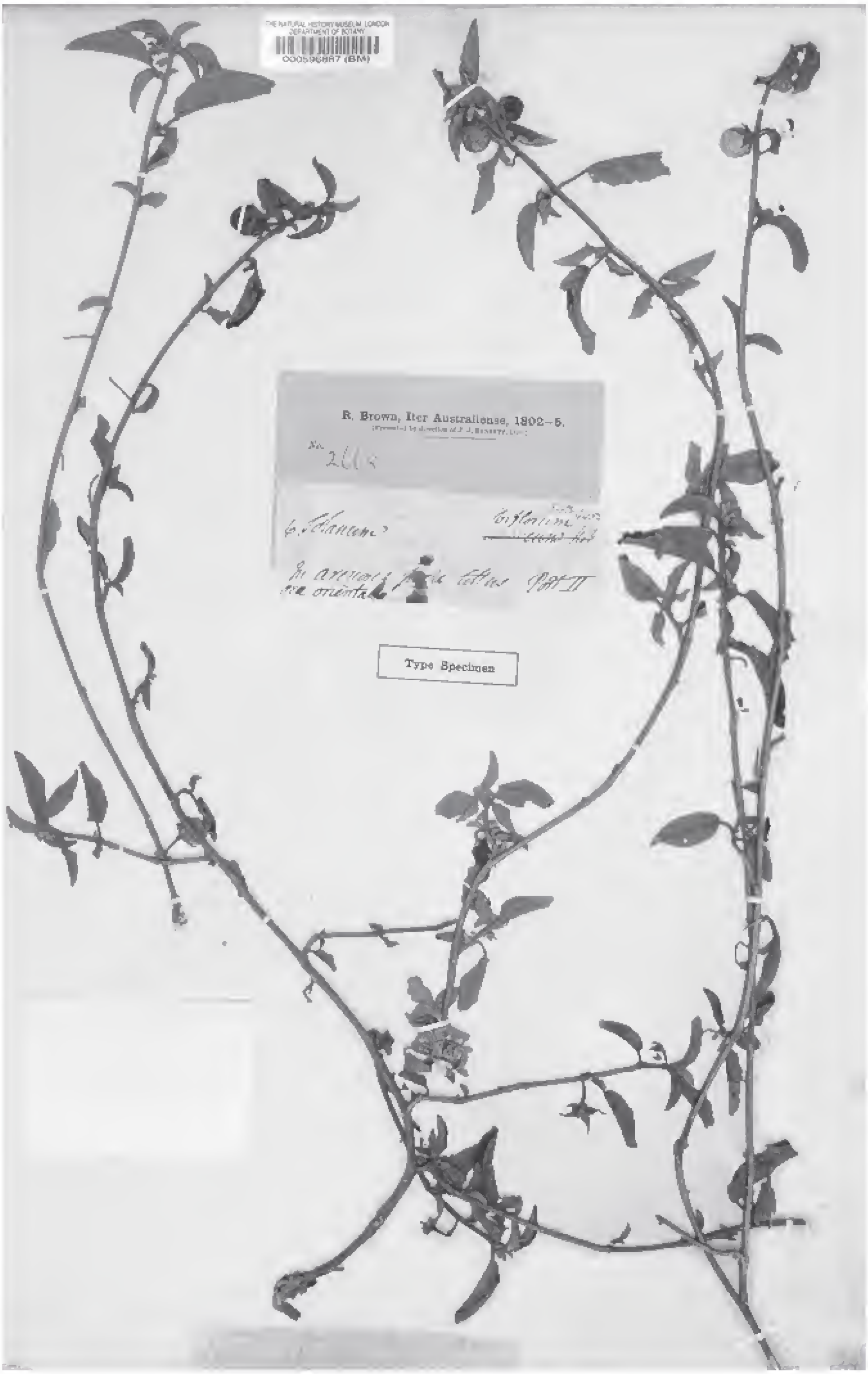

THE NATURAL HISTORY MUSEUM, LONDON
DEPARTMENT OF BOTANY
000596887 (BM)
R. Brown, Iter Australiense, 1802–5.
No.
6. Solanum?
biflorum
Type Specimen

Fig. 29. Holotype of ***Solanum dianthophorum***.

than half the fruit length and with 1–4 tiny prickles (calyx > half fruit length, with 5–50 stout prickles for *S. ellipticum*).

No other collections are known which resemble this specimen. Bentham (1868) cited two other specimens for *S. dianthophorum*, *i.e.* “Bay of Inlets” Banks & Solander, and “Percy Islands” A. Cunningham, but I have not seen these.

Either *S. dianthophorum* is a very restricted endemic, or the type represents an extreme form of *S. ellipticum*. A field survey around Port Clinton should clarify the matter.

***Conservation status*:** Data deficient.

47. Solanum crebrispinum A.R.Bean **sp. nov.** Frutex perennis erectus, ramulis teretibus aculeis 180–420 per decimetrum; folia ovata, integra; pagina superiore aculeis praedita et dense stellato-pilosa; stellae 0.8–1.2 mm diametro, pedicellis 0.1–0.9 mm longis; pagina inferior folii densissime stellato-pilosa, floccosiuscula; calyx aculeis 50–70 validissimis praeditus, stellis proximale affixis; lobi calycis attenuati; stylus functionalis tantum pilis Type-2 praeditus. **Typus:** Queensland. South Kennedy District: 23 km SE of ‘Teamass’ Homestead, 10 June 1992, *E.J. Thompson* BUC457 & *P.R. Sharpe* (holo: BRI; iso: AD).

Erect, rhizomatous perennial shrub, 0.3–0.5 m high. Juvenile stage unknown. Adult branchlets yellow or rusty; prickles 180–420 per decimetre, straight, acicular, 2–11 mm long, 11–15 times longer than wide; stellae very dense, 0.9–1.2 mm diameter, stalks 0–1 mm long; lateral rays 6–8, porrect or ascending; central ray 1–1.7 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Adult leaves* ovate or broadly ovate, entire; lamina 5–9.5 cm long, 2.8–5.5 cm wide, 1.6–1.8 times longer than broad, apex obtuse, acute or acuminate, base obtuse or cordate, oblique part 0–3 mm long, obliqueness index 0–6 percent; petioles 1.1–4.4 cm long, 20–45% length of lamina, prickles present. *Upper leaf surface* grey-green; prickles 3–35, straight, acicular, 1–5 mm long, prickles present on midvein only or present on midvein and lateral veins; stellate hairs distributed throughout; protostellae present; ordinary stellae dense, 0.2–0.4 mm apart, 0.8–1.2 mm across, stalks 0.1–0.9 mm long; lateral rays 7 or 8, porrect or ascending; central ray 1–1.7 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Lower leaf surface* yellowish; prickles 5–20, straight, acicular, present on midvein only or present on midvein and lateral veins; stellae dense to very dense, 0.05–0.25 mm apart, 0.7–1.2 mm diameter, stalks 0–1 mm long; lateral rays 6–8, porrect or ascending; central ray 1–1.7 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Inflorescence* supra-axillary, pseudo-racemose, common peduncle 0–25 mm long, rachis prickles present; 3–5-flowered, flowers 5-merous; pedicels 4–6 mm long at anthesis, same thickness throughout, 0.9–1.2 mm thick at mid-point, prickles present. Calyx tube 1.5–2 mm long, lobes attenuate, 3–5.5 mm long; prickles present at anthesis, 50–70 per flower, 2–6 mm long; stellae very dense, yellow or white, 0.7–0.9 mm across, stalks 0–0.7 mm long, lateral rays 7 or 8, central ray 1–1.7 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. Corolla purple, 8–10 mm long, shallowly lobed, inner surface glabrous; anthers *c.* 3.8 mm long; ovary with Type 2 hairs only; functional style *c.* 5.8 mm long, erect, with Type 2 hairs only. *Fruiting calyx* with lobes more than half length of mature fruit, prickles 3–6 mm long. Mature fruits 1 or 2 per inflorescence, globular, 14–16 mm diameter, yellowish-green or green; mesocarp moist but not juicy; pedicels 8–9 mm long in fruit, 1.5–1.8 mm thick at mid-point. **Fig. 30.**

***Specimens examined*:** **Queensland.** South Kennedy District: on crest of Great Dividing Range, *c.* 25 km NNW of ‘Yarrowmere’ HS, *c.* 92 km SSE of Pentland, Oct 1983, *Henderson* H2821 *et al.* (BRI); on Llanarth Back Range road, 9.4 km S of junction with Scartwater road, May 1991, *Neldner* 3525A & *Thompson* (BRI); 4 km N of ‘Moonoomoo’ in headwaters of Carmichael Creek, Apr 1992, *Thompson* BUC247 & *Simon* (BRI); 10 km W of ‘St Anns’ HS, Jun 1992, *Thompson* BUC454 & *Sharpe* (BRI).

***Distribution and habitat*:** *Solanum crebrispinum* is endemic to Queensland. Apparently restricted to the Lake Buchanan area south of Charters Towers (**Map 17**). It grows on sandstone ridges or “jump-ups” with *Eucalyptus similis, E. leichhardtii* or *Acacia*

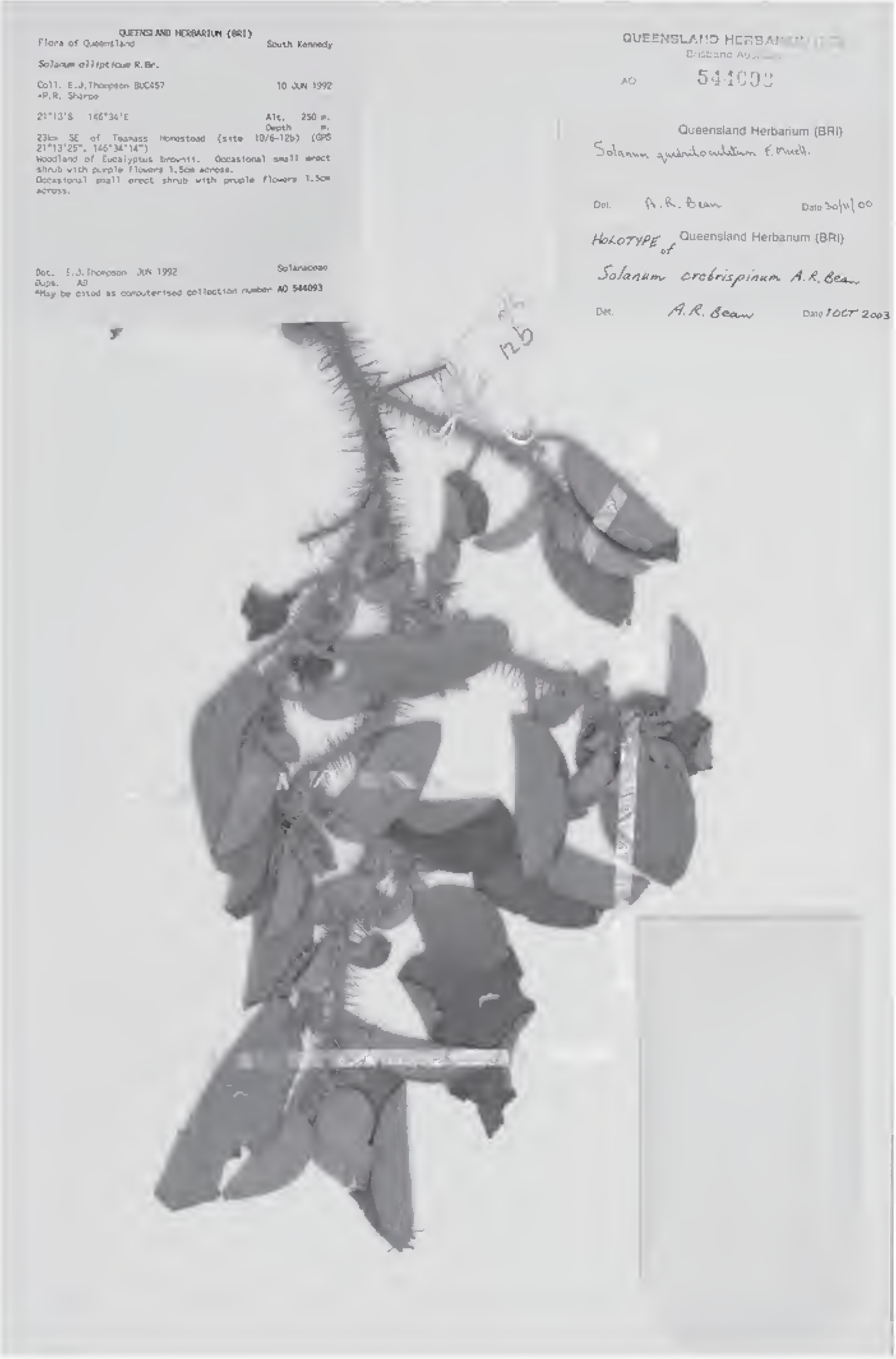

QUEENSLAND HERBARIUM (BRI)
Flora of Queensland
South Kennedy
Solanum ellipticum R.Br.
Coll. E.J.Thompson BUC457
+P.R. Sharpe
10 JUN 1992
21°13'S 146°34'E
Alt. 250 m.
Depth m.
23km SE of Teamass Homestead (site 10/6-12b) (GPS 21°13'25", 146°34'14")
Woodland of Eucalyptus brownii. Occasional small erect shrub with purple flowers 1.5cm across.
Occasional small erect shrub with purple flowers 1.5cm across.
Det. E.J.Thompson JUN 1992
Solanaceae
Dups. AD
*May be cited as computerised collection number AQ 544093
QUEENSLAND HERBARIUM
AQ 544093
Queensland Herbarium (BRI)
Solanum quadriloculatum F.Muell.
Det. A.R. Bean
Date 30/11/00
HOLOTYPE of
Queensland Herbarium (BRI)
Solanum crebrispinum A.R.Bean
Det. A.R. Bean
Date 1 OCT 2003
12b

Fig. 30. Holotype of ***Solanum crebrispinum***.

shirleyi. One specimen records *Eucalyptus brownii* as the dominant tree.

***Phenology*:** Poorly known. Flowers are recorded for April, June and October; fruits are recorded for April and October.

***Notes*:** *S. crebrispinum* is related to *S. ellipticum*, but differs by the erect habit, the branchlet stellae 0.9–1.2 mm across (0.5–0.8 mm for *S. ellipticum*) on stalks up to 1.0 mm long (up to 0.3 mm long for *S. ellipticum*), the presence of protostellae on the upper leaf surface, normal stellae 0.8–1.2 mm across (0.4–0.7 mm for *S. ellipticum*), on very thick stalks 0.1–0.9 mm long (thin stalks 0–0.3 mm long for *S. ellipticum*), and the 50–70 calyx prickles (5–50 for *S. ellipticum*). On the branchlets, upper and lower leaf surface, and on the calyx, the central ray of the stellae is 1–1.7 times as long as the laterals; this compares with 0.5–1 times for *S. ellipticum*.

***Conservation status*:** Collection density in this area is low. Not considered at risk.

***Etymology*:** From the Latin *crebra* - abundant, and *spina* - spines or prickles. This refers to the abundant prickles on the branchlets and calyx.

48. Solanum senticosum A.R.Bean **sp. nov.** Frutex perennis erectus; ramuli teretes brunnei vel ferruginei, aculei 180–400 per decimetrum; folia ovata, integra, ad basim cuneata; pagina inferior folii ferruginea, stellis radio centrali 0.6–1.2plo lateralibus longiore; inflorescentia 1–3-flora; stylus functionalis 7.5–8.5 mm longus, glaber; calyx aculeis 40–65 validissimis et lobi attenuati praeditus. **Typus:** Queensland. BURKE DISTRICT: 4.5 miles [7 km] southwest of Mount Isa, 5 July 1974, *P. Ollerenshaw* 1220 & *D. Kratzing* (holo: BRI; iso: AD, *n.v.*, CANB).

Solanum ellipticum var. *horridum* Domin, Biblioth. Bot. 89: 588 (1929). **Type:** Queensland. BURKE DISTRICT: around Cloncurry, February 1910, *K. Domin* (holo: PR, photo at BRI).

Erect, rhizomatous perennial shrub, 0.3–0.6 m high. Juvenile stage unknown. Adult branchlets rusty or brown; prickles 180–400 per decimetre, straight, acicular, 1.5–6 mm long, 11–18 times longer than wide; stellae very dense, 0.6–0.9 mm diameter, stalks 0–0.4 mm long; lateral rays 7 or 8, porrect or ascending; central ray 0.6–1.2 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Adult leaves* ovate, entire; lamina 3.5–9 cm long, 1.2–3.4 cm wide, 1.9–2.7 times longer than broad, apex acute, base cuneate, oblique part 0–5 mm long, obliqueness index 0–9 percent; petioles 0.7–1.7 cm long, 19–30% length of lamina, prickles present. *Upper leaf surface* grey; prickles 0–6, straight, acicular, 1–4 mm long, prickles absent or present on midvein only; stellate hairs distributed throughout; protostellae absent; ordinary stellae dense, 0.1–0.25 mm apart, 0.6–1 mm across, stalks 0–0.25 mm long; lateral rays 7 or 8, porrect; central ray 0.8–1.2 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Lower leaf surface* rusty; prickles 0–10, straight, acicular, absent or present on midvein only or present on midvein and lateral veins; stellae dense to very dense, 0.1–0.2 mm apart, 0.7–1 mm diameter, stalks 0–0.6 mm long; lateral rays 7 or 8, porrect; central ray 0.6–1.2 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Inflorescence* supra-axillary, solitary or pseudo-racemose, common peduncle 0–2 mm long, rachis prickles present; 1–3-flowered, flowers 5-merous; pedicels 5–11 mm long at anthesis, same thickness throughout, 0.9–1.2 mm thick at mid-point, prickles absent or present. Calyx tube 2–3.5 mm long, lobes attenuate, 4–9 mm long; prickles present at anthesis, 40–65 per flower, 1–4 mm long; stellae very dense, brown or rusty, 0.4–0.6 mm across, stalks 0–0.2 mm long, lateral rays 6–8, central ray 0.6–1.2 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. Corolla purple, 7–11 mm long, shallowly or deeply lobed, inner surface glabrous; anthers 4–4.5 mm long; ovary glabrous; functional style 7.5–8.5 mm long, erect, glabrous. *Fruiting calyx* with lobes more than half length of mature fruit, prickles 2–5 mm long. Mature fruits 1 or 2 per inflorescence, globular, 12–14 mm diameter, green; mesocarp moist but not juicy; pedicels 6–14 mm long in fruit, 1.2–1.5 mm thick at mid-point. **Fig. 31.**

***Specimens examined*:** **Queensland.** BURKE DISTRICT: Mt Isa, Apr 1935, *Blake* 8780 (BRI); 3 km from kiosk road, near Lake Moondarra, NW of Mt Isa, Aug 1973, *Swan* 110 (BRI); 60 km E of Mount Isa on the Mount Isa–Cloncurry road, Aug 1973, *Swan* 116 (BRI); hill with radio repeater 4141 on

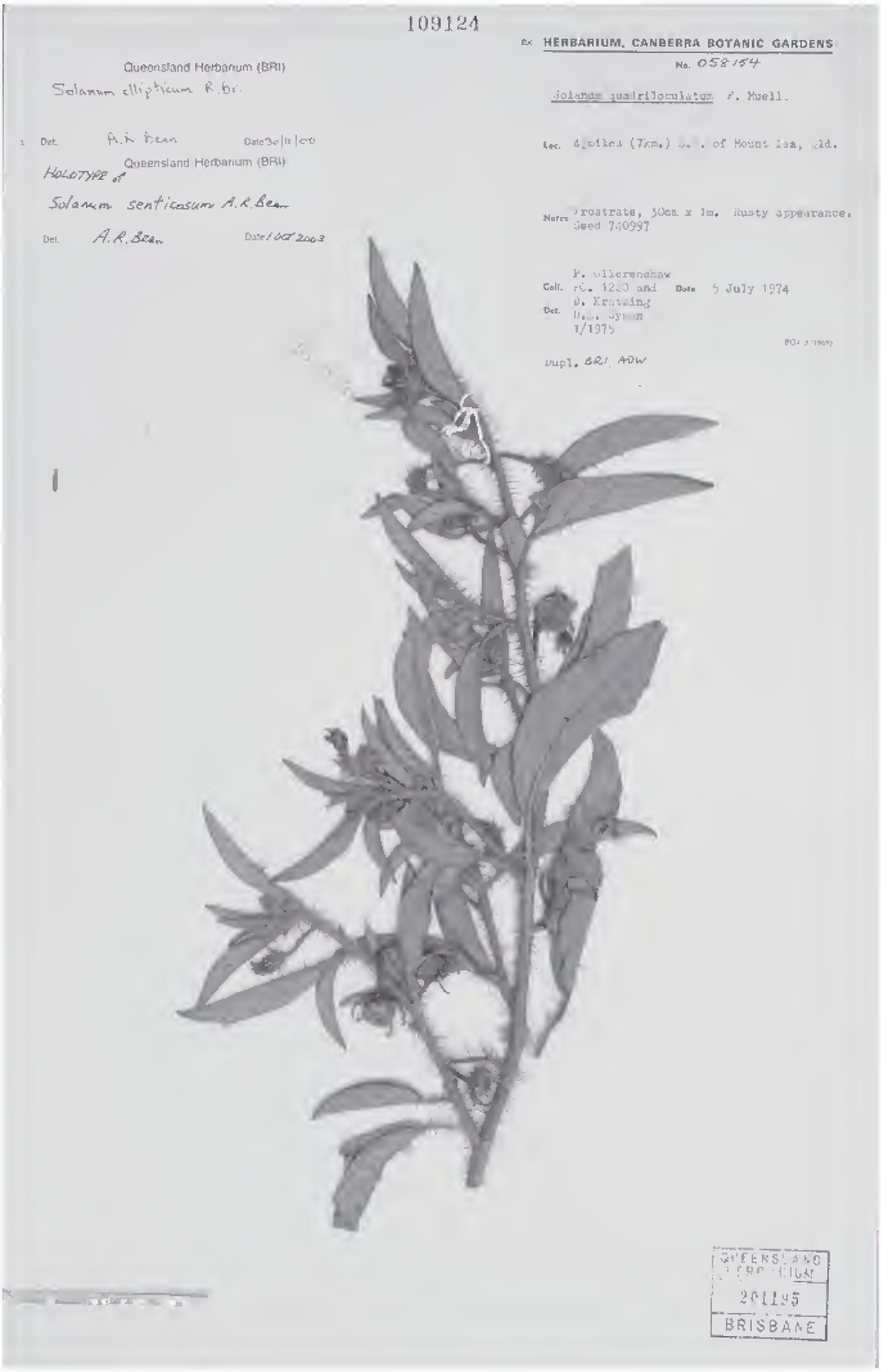

109124
Queensland Herbarium (BRI)
Solanum ellipticum R.Br.
Det. A.R. Bean Date 30|11|00
Queensland Herbarium (BRI)
HOLOTYPE of
Solanum senticosum A.R.Bean
Det. A.R.Bean Date 1 OCT 2003
ex HERBARIUM, CANBERRA BOTANIC GARDENS
No. 058154
Solanum quadriloculatum F. Muell.
Loc. 4 miles (7km.) S.W. of Mount Isa, Qld.
Notes Prostrate, 50cm x 1m. Rusty appearance. Seed 740997
Coll. P. Ollerenshaw, RC. 1230 and D. Kratzing
Date 5 July 1974
Det. D.E. Symon 1/1975
Dupl. BRI, ADW
QUEENSLAND HERBARIUM
201195
BRISBANE

Fig. 31. Holotype of ***Solanum senticosum***.

Barkly Highway 24 km NNW of Mount Isa, May 1974, *Kanis* 1701 (BRI, CANB, K); Mount Isa, May 1952, Morris 143 (BRI); Mount Isa, Oct 1974, *Specht* 75 & *Rogers* (BRI); north end of dam, 4 km SW of Mt Isa, Aug 1986, *Harris* 66 (BRI); Millican Creek, track to Telstra tower, Barkly Hwy, Apr 1997, *Forster* PIF20821 & *Holland* (BRI); SO_2 study site MR6, 8.27 km to Mt Isa copper stack at 339°, Apr 1998, *Fell* DGF5235 & *Barrs* (BRI); 'Riversleigh', Campbells Camp on the Gregory River, Jul 1998, *Symon* 15794 (AD, BRI). GREGORY NORTH DISTRICT: 'Elderslie', Winton, Sep 1934, *Kennedy* 21 (BRI); Duchess, May 1936, *Blake* 11528 (BRI); track to Mistake Hut, Bladensberg N.P., S of Winton, Mar 1998, *Forster* PIF22230 & *Booth* (AD, BRI, MEL). MITCHELL DISTRICT: 'Springdale', N of Aramac, Jul 2000, *Fensham* 3946 (BRI).

***Distribution and habitat*:** *Solanum senticosum* is endemic to Queensland. Most collections are from the Mount Isa area, but it extends to Winton and Aramac (**Map 17**). It is most often recorded from rocky ridges dominated by *Eucalyptus leucophloia* subsp. *euroa* with *Triodia* understorey.

***Phenology*:** Flowers are recorded from March to October; fruits from March to August.

***Notes*:** *S. senticosum* is close to *S. ellipticum*, but differs by the erect shrubby habit; the rusty indumentum on the stems, leaves and calyces; the more densely prickly branchlets; the consistently cuneate leaf bases; the larger stellae on the upper leaf surface; and the calyx with many stout prickles in longitudinal rows.

The Symon collection from Riversleigh is atypical as it lacks the rusty colouration of the stems and leaves.

***Conservation status*:** Widespread. Not considered at risk.

***Etymology*:** from the Latin *senticosus* - full of thorns or prickles.

49. Solanum quadriloculatum F.Muell., Fragm. 2: 161 (1861). **Type:** [Queensland. BURKE DISTRICT:] Gulf of Carpentaria, Nicholson River, 21–24 August 1856, *F. Mueller* (lecto: MEL [MEL11735]), *fide* Symon (1981).

***Illustration*:** Symon (1981: 211).

Sprawling, herbaceous resprouter or rhizomatous perennial shrub, 0.1–0.3 m high. Juvenile stage unknown. Adult branchlets ridged, yellow or rusty; prickles 240–700 per decimetre, straight, acicular, 2–8 mm long, 11–20 times longer than wide; stellae very dense, 0.5–1 mm diameter, stalks 0–0.8 mm long; lateral rays 7 or 8, ascending; central ray 0.8–1.2 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Adult leaves* ovate, entire; lamina 5.5–14.5 cm long, 2.5–7 cm wide, 1.7–2.3 times longer than broad, apex obtuse or acute, base cuneate or obtuse, oblique part 0–6 mm long, obliqueness index 0–5 percent; petioles 0.8–4.4 cm long, 15–60% length of lamina, prickles present. *Upper leaf surface* grey; prickles 1–10, straight, acicular, 2–5 mm long, prickles present on midvein only or present on midvein and lateral veins; stellate hairs distributed throughout; protostellae absent; ordinary stellae dense to very dense, 0.05–0.2 mm apart, 0.6–1.2 mm across, stalks 0–1 mm long; lateral rays 7 or 8, porrect or ascending; central ray 0.8–1.2 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Lower leaf surface* white or yellowish; prickles 3–20, straight, acicular, present on midvein only or present on midvein and lateral veins; stellae very dense, 0.05–0.1 mm apart, 0.7–1.2 mm diameter, stalks 0–1.6 mm long; lateral rays 7 or 8, porrect or ascending; central ray 0.8–1.2 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Inflorescence* supra-axillary, pseudo-racemose, common peduncle 23–60 mm long, rachis prickles absent; 9–15-flowered, with all flowers bisexual and 5-merous; pedicels 4–11 mm long at anthesis, same thickness throughout, 1–1.2 mm thick at mid-point, prickles absent. Calyx tube 2–4 mm long, lobes deltate or attenuate, 1.5–4.5 mm long; prickles present at anthesis, 5–40 per flower, 1–3 mm long; stellae very dense, yellow or white, 0.5–0.9 mm across, stalks 0–1.2 mm long, lateral rays 7 or 8, central ray 0.8–1.2 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. Corolla mauve or purple, 9–15 mm long, shallowly or deeply lobed, inner surface glabrous; anthers 5.5–6.5 mm long; ovary glabrous; functional style 9–10.5 mm long, erect, glabrous. *Fruiting calyx* with lobes less than or more than half length of mature fruit, prickles 1–3 mm long. Mature fruits 1–6 per inflorescence, globular, 14–17 mm diameter, yellowish-green, 4-locular; pedicels 11–17 mm long in fruit, 1.1–1.9 mm thick at mid-point; seeds pale yellow, 2.3–2.9 mm long.

Specimens examined**: Queensland.** Burke District: Cloncurry, Nov 1935, *Blake* 10109 (BRI); 'Barkly Downs', *c.* 50 miles [80 km] SE of Camooweal, Dec 1947, *Everist* 3381 (BRI); Dugald River, Apr 1962, *Cole* 128 & *Provan* (BRI); c. 24 km W of Cloncurry, on road to Mt Isa, Apr 1973, *Henderson* H1854 (BRI); 5 km SW of Mt Isa, Apr 1976, *Farrell* TF369 (BRI); 105 km N of Cloncurry, Apr 1993, *Milson* JM357 (BRI); 85 km from Cloncurry on the Normanton highway near 'Coolulla' station, Jul 1993, *Alcock* 11283 (AD, BRI); Riversleigh road, 22 km ESE of 'Riversleigh' HS towards Burketown–Camooweal road, Aug 1993, *Lally* 99 (BRI, CANB); 34 km NW of McKinlay, Apr 1996, *Milson* JM1011 (BRI); 15 km from Mt Isa on Duchess road, May 1997, *Forster* PIF21180 & *Booth* (BRI, DNA); Camooweal Caves N.P., Aug 1999, *Fox* IDF707 & *Middleton* (BRI); between Cloncurry and Mt Isa on Barkly Highway, Apr 2001, *McDonald* KRM826 (AD, BRI). Gregory North District: Georgina River, May 1933, *Whitehouse* (BRI); between Glenormiston and Toko Range, Feb 1935, *Boyle s.n.* (BRI); Duchess–Mt Isa road, May 1963, *Gittins* 735 (BRI); QT Bore, 29 km SE of 'Kollala', May 1985, *Neldner* 1963 & *Stanley* (BRI); 3 km N of 'Bushy Park' HS, 21 km NW of Duchess, May 1985, *Neldner* 2113 & *Stanley* (BRI); Trough Tank, Placer Pacific Osborne exploration lease, 30 km N of Pathungra, May 1993, *Gunness* AG2188 (BRI).

Distribution and habitat**:** In Queensland, *Solanum quadriloculatum* is confined to the north-west, from Lawn Hill N.P. to Duchess, and east to Cloncurry (**Map 19**). It also occurs in Northern Territory and the Kimberley of Western Australia. It inhabits low open eucalypt woodland on gravelly hills and flats.

Phenology**:** Flowers and fruits are recorded from April to December.

Notes**:** *S. quadriloculatum* is closely related to *S. ellipticum*, but differs by the conspicuously ridged branchlets, the presence of long-stalked stellae (stalks > 0.4 mm long and up to 1.6 mm long) on all plant parts, the mostly larger stellae on the upper and lower leaf surfaces, the 9–15 flowered inflorescences (1–9 flowered for *S. ellipticum*), the flimsy (non-rigid) prickles on the calyx, and the absence of prickles on the rachis of the inflorescence.

Solanum quadriloculatum is consistently 4-locular, but some forms of *S. ellipticum* may also be 4-locular.

The type of *S. quadriloculatum* was collected from the Nicholson River at about 18° latitude. All subsequent collections of *S. quadriloculatum* have been made further south (19–22.5° latitude). The type (which is rather scrappy) does not match the subsequent collections terribly well. It has broad based prickles, < 10 times longer than wide, the stellae of the upper leaf surface are relatively widely spaced (moderate to dense) and the stellae stalks are very short. Collections from the type locality are sorely needed to determine if the name has been correctly applied. The full description given above is based on the modern collections.

Conservation status**:** Widespread. Not considered at risk.

50. Solanum crassitomentosum Domin, Biblioth. Bot. 89: 584 (1929). **Type:** Queensland. North Kennedy District: Dividing range west of Pentland, February 1910, *K. Domin* (holo: PR).

Erect, rhizomatous perennial shrub, 0.3–1 m high. Juvenile stage unknown. Adult stems bark furrowed, corky. Adult branchlets terete or ridged, yellow or rusty or brown; prickles 30–160 per decimetre, straight, acicular, 1–5 mm long, 10–16 times longer than wide; stellae very dense, 0.25–0.7 mm diameter, stalks 0–0.7 mm long; lateral rays 6–9, ascending; central ray 1–2 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Adult leaves* ovate or broadly ovate, entire; lamina 3.5–7.5 cm long, 1.5–3.5 cm wide, 1.7–2.3 times longer than broad, apex acute, base obtuse or cordate, oblique part 0–3 mm long, obliqueness index 0–6 percent; petioles 0.8–2.6 cm long, 16–35% length of lamina, prickles absent or present. *Upper leaf surface* grey; prickles absent; stellate hairs distributed throughout; protostellae absent; ordinary stellae very dense, *c.* 0.05 mm apart, 0.5–0.7 mm across, stalks 0–0.7 mm long; lateral rays 6–8, porrect; central ray 1.2–2.5 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Lower leaf surface* white or yellowish; prickles absent; stellae dense to very dense, 0.05–0.1 mm apart, 0.4–0.8 mm diameter, stalks 0–1 mm long; lateral rays 7 or 8, porrect; central ray 1.5–2 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Inflorescence* leaf-opposed, solitary or pseudo-racemose, common peduncle 5–14 mm long, rachis prickles absent; 1 or 2-flowered, strongly or weakly andromonoecious, flowers 5-merous; pedicels 4–11 mm long at anthesis, same thickness throughout or markedly thicker distally, 1.1–1.5 mm thick at mid-point, prickles absent. Calyx tube 3.5–5 mm long, lobes deltate, 4–7 mm long; prickles absent at anthesis; stellae very dense, transparent or brown or rusty, 0.5–0.7 mm across, stalks 0.3–0.9 mm long, lateral rays 7 or 8, central ray 1–2 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. Corolla white, mauve or purple, 12–17 mm long, shallowly or deeply lobed, inner surface densely stellate-hairy; anthers 5.5–7.5 mm long; ovary glabrous, or with Type 2 hairs only; functional style 10.5–12.5 mm long, erect, glabrous. *Fruiting calyx* with lobes less than or more than half length of mature fruit, prickles absent. Mature fruits 1 per inflorescence, globular, 14–18 mm diameter, yellowish-green or green, 4-locular; placenta in cross-section stalked, circular to elliptical; mesocarp moist but not juicy; exocarp 2.4–3 mm thick; pedicels 7–13 mm long in fruit, 1.3–1.5 mm thick at mid-point; seeds brown to black, 2.5–2.8 mm long.

Specimens examined**: Queensland.** BURKE DISTRICT: 'Warang' area, White Mountains N.P., Apr 2000, *McDonald* KRM385 (BRI); NW of 'Warang', White Mountains N.P., Apr 2000, *McDonald* KRM467 (BRI); 20 km W of 'Warang' HS site, White Mountains N.P., 57 km by road N of Torrens Creek, Apr 2000, *Thomas* 1835 & *Thompson* (BRI, NSW); 3 km NW of 'Warang' HS site, White Mountains N.P., Apr 2000, *Thomas* 1840 & *Thompson* (BRI, NSW). NORTH KENNEDY DISTRICT: W of Pentland, between Warrigal and Burra, Oct 1935, *Blake* 9921 (BRI); Burra Range, W of Pentland, Jul 1985, *Williams* 85048 (BRI); White Mountains N.P., east of 'Warang', Mar 2000, *Wannan* 1629 & *Martindale* (BRI, MEL). MITCHELL DISTRICT: Poison Valley road, White Mountains N.P., Apr 2000, *McDonald* KRM426 (BRI); 7 km E of 'Warang' HS on track to Sandstone Wall, Apr 2000, *Thomas* 1452 & *Thompson* (BRI, NSW).

Distribution and habitat**:** *Solanum crassitomentosum* is endemic to Queensland. Confined to the White Mountains–Burra Range area, W of Townsville (**Map 19**). It grows in eucalypt woodland on sandstone. The dominant tree species include *Eucalyptus exilipes, E. lamprophylla, E. leichhardtii, Acacia shirleyi* or *Lysicarpus angustifolius. Triodia* is often present in the ground layer.

Phenology**:** Flowers are recorded for March, April, July and October; mature fruits recorded for April.

Notes**:** *S. crassitomentosum* is related to *S. quadriloculatum*, but differs by the 1 or 2 flowered inflorescence (9–15 flowered for *S. quadriloculatum*), calyx and leaf laminae without prickles (leaves and calyx prickly for *S. quadriloculatum*), inner surface of corolla densely stellate hairy (*vs.* glabrous for *S. quadriloculatum*), central ray of stellae on lower leaf surface 1.5–2 times lateral rays (*vs.* 0.8–1.2 times for *S. quadriloculatum*) and the brown to black seeds (*vs.* pale yellow for *S. quadriloculatum*).

Conservation status**:** *S. crassitomentosum* is currently known from 4 locations, all within the White Mountains National Park. There are no substantial threats to the species, and it is not considered to be at risk.

51. Solanum angustum Domin, Biblioth. Bot. 80: 588–589 (1929). **Type:** Queensland. COOK DISTRICT: Walsh River, north of Chillagoe, February 1910, *K. Domin* (holo: PR).

Sprawling, herbaceous resprouter, *c.* 0.3 m high. Juvenile stage absent. Adult branchlets grey or yellow; prickles 5–30 per decimetre, straight, acicular, 3–6 mm long, 10–15 times longer than wide; stellae very dense, 0.3–0.5 mm diameter, stalks 0–0.1 mm long; lateral rays 6–8, porrect; central ray present, 0.5–1 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Adult leaves* narrow lanceolate to ovate or elliptical, entire or shallowly lobed throughout; lobes 2 or 3 on each side, obtuse, lobing index 1–1.3; lamina 1.5–4 cm long, 0.4–1.4 cm wide, 3–7.5 times longer than broad, apex obtuse, base cuneate, oblique part 0–1 mm long, obliqueness index 0–3 percent; petioles 0.3–2.2 cm long, 17–55% length of lamina, prickles absent. *Upper leaf surface* green; prickles 0–3, straight, acicular, 3–6 mm long, prickles absent or present on midvein only; stellate hairs distributed throughout; protostellae absent; ordinary stellae sparse to moderate density, 0.3–0.9 mm apart, 0.25–0.4 mm across, sessile; lateral rays 6–8, porrect; central ray 0.5–1 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Lower leaf surface* green or yellowish; prickles absent; stellae sparse to dense, 0.1–0.7 mm apart, 0.3–0.6 mm diameter, stalks 0–0.1 mm long;

lateral rays 7 or 8, porrect; central ray 0.5–1 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Inflorescence* leaf-opposed, solitary or pseudo-racemose, common peduncle 0–15 mm long, rachis prickles present; 1–4-flowered, flowers 5-merous; pedicels *c.* 7 mm long at anthesis, same thickness throughout, *c.* 0.8 mm thick at mid-point, prickles present. Calyx tube 2.5–3 mm long, lobes deltate, 2–2.5 mm long; prickles present at anthesis, 2–10 per flower, 1–4 mm long; stellae dense, transparent, 0.3–0.4 mm across, sessile, lateral rays 7 or 8, central ray 0.5–1 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. Corolla *c.* 10 mm long. *Fruiting calyx* with lobes more than half length of mature fruit, prickles 1–4 mm long. Mature fruits 1 per inflorescence, globular, 16–20 mm diameter, green; pedicels 15–20 mm long in fruit, 0.9–1.2 mm thick at mid-point; seeds pale yellow, 2.5–3 mm long.

***Specimens examined*:** **Queensland.** COOK DISTRICT: Stannary Hills, 1908, *Bancroft* 173 (BRI); Alma-den, Nov 1939, *Thurston* 575 (QRS); 26 km W of Einasleigh on road to Forsayth, on top of Newcastle Range, Apr 1992, *Halford* Q958 (AD, BRI, MEL).

***Distribution and habitat*:** *Solanum angustum* is endemic to Queensland and known only from the type and two other collections (cited above) (**Map 20**). The label of the only recent collection indicated that the species was growing in “low eucalypt woodland with shallow clay soil”.

***Phenology*:** Very poorly known. Fruits have been collected in April.

***Notes*:** The affinities of this species are not known with any certainty, and it is only tentatively placed in the *S. ellipticum* group.

***Conservation status*:** *S. angustum* has been collected just four times, in 1908, 1910, 1939 and 1992. A recent visit to the 1992 collection site failed to find the species. It has not been seen since 1992, despite deliberate searches during the summer months, especially in the Chillagoe–Walsh River area. Although there are no known extant populations, a presumption of extinction is premature. There would appear to be much available habitat within the extent of occurrence, although the required habitat for the species is still not known.

Applying the IUCN guidelines (IUCN. 2001), and using the 1992 location as an *existing* location, a category of “Endangered” is recommended (EN C2a(ii); D).

52. Solanum argopetalum A.R.Bean **sp. nov.** Frutex prostratus vel fusus; folia late ovata, non profunde lobata, basi cordata et petiolis 12–35 mm longis; pili stellati aliqui apicibus glandularibus in ramulis foliisque praesentes; aculei in ramulis sparse distributi, 1–5 mm longi, calyci absentes; corolla albida, 7–9 mm longa; fructus maturi virides usque flavi. **Typus:** Queensland. MARANOA DISTRICT: near ‘Boxleigh’, *c.* 60 km NE of St George, 24 April 2001, *A.R. Bean* 17644 & *L. Pedley* (holo: BRI; iso: AD, CANB, K, MEL, MO, NSW, PRE, *distribuendi*).

Prostrate or sprawling, herbaceous resprouter, 0.1–0.4 m high. Juvenile branchlets with 50–100 prickles per dm, 2–5 mm long; leaves (in outline) broadly ovate, shallowly-lobed, with 2–4 pairs of lobes; lamina *c.* 5 × 4.5 cm, with 20–40 prickles on upper surface. Adult branchlets yellow, rusty or brown; prickles 5–25 per decimetre, straight, acicular, 1–5 mm long, 10–17 times longer than wide; stellae dense, 0.4–0.7 mm diameter, stalks 0–0.25 mm long; lateral rays 6–11, porrect or ascending; central ray present, 1.5–3 times as long as laterals, not gland-tipped or gland-tipped; finger hairs absent; Type 2 hairs sparse. *Adult leaves* broadly ovate or orbicular, entire or shallowly lobed throughout; lobes 2 or 3 on each side, obtuse, lobing index 1–1.2; lamina 3.5–8.5 cm long, 2–5.5 cm wide, 1.2–1.7 times longer than broad, apex obtuse, base cordate, oblique part 0–3.5 mm long, obliqueness index 0–5 percent; petioles 1.2–3.5 cm long, 30–65% length of lamina, prickles absent. *Upper leaf surface* grey-green; prickles 0–2, straight, acicular, 1–3 mm long, prickles absent or present on midvein only; stellate hairs distributed throughout; protostellae present; ordinary stellae density moderate, 0.4–0.6 mm apart, 0.6–0.9 mm across, stalks 0–0.3 mm long; lateral rays 7–10, porrect or ascending; central ray 1–3 times as long as laterals, not gland-tipped or gland-tipped; finger hairs

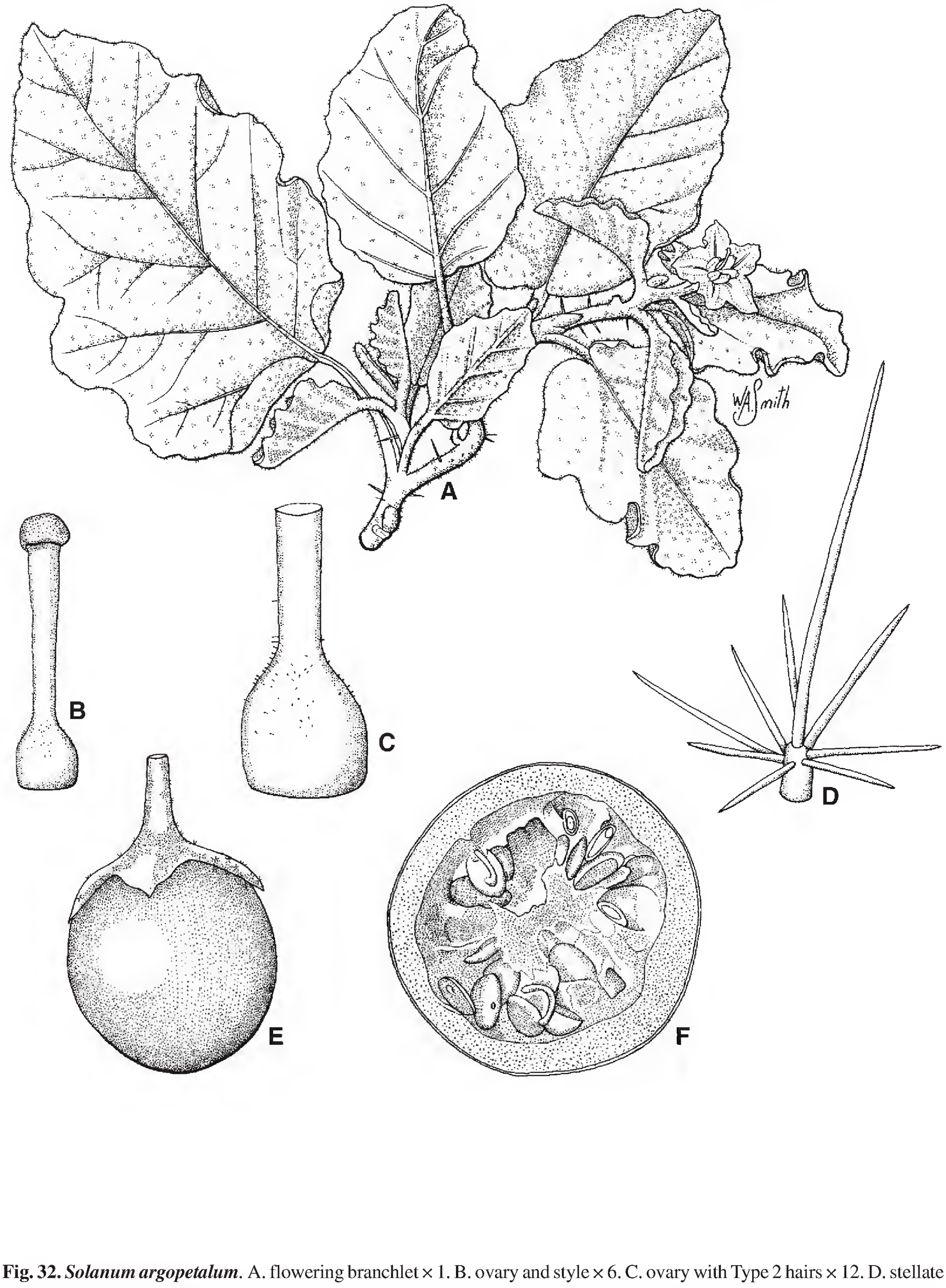


Fig. 32. ***Solanum argopetalum***. A. flowering branchlet × 1. B. ovary and style × 6. C. ovary with Type 2 hairs × 12. D. stellate hair, upper leaf surface × 50. E. mature fruit and calyx × 2. F. transverse section of fruit × 3. A–D, *Bean* 17644 & Pedley; E–F, *Bean* 17768.

absent or present, 0.3–0.6 mm apart, gland-tipped, 0.1–0.3 mm long; Type 2 hairs absent. *Lower leaf surface* green, or greenish-white; prickles absent; stellae dense, 0.1–0.2 mm apart, 0.5–0.6 mm diameter, stalks 0–0.1 mm long; lateral rays 8–11, porrect; central ray 1–1.5 times as long as laterals, not gland-tipped or gland-tipped; finger hairs absent; Type 2 hairs absent. *Inflorescence* leaf-opposed or supra-axillary, solitary or pseudo-racemose, common peduncle 0–2 mm long, rachis prickles absent or present; 1–4-flowered, weakly andromonoecious or with all flowers bisexual, flowers 4 or 5-merous; pedicels 3–10 mm long at anthesis, same thickness throughout, 0.5–0.6 mm thick at mid-point, prickles absent. Calyx tube 1.5–3 mm long, lobes deltate, rostrate or attenuate, 2–7 mm long; prickles absent at anthesis; stellae dense, transparent, 0.4–0.7 mm across, stalks 0–0.2 mm long, lateral rays 6–10, central ray 1–2 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. Corolla white, 7–9 mm long, deeply lobed, inner surface glabrous; anthers 3–4 mm long; ovary with Type 2 hairs only; functional style 4.5–6 mm long, erect, with Type 2 hairs only. *Fruiting calyx* with lobes less than or more than half length of mature fruit, prickles absent. Mature fruits 1–3 per inflorescence, globular, *c.* 15 mm diameter, yellowish-green or green, 1-locular (septum absent or incomplete); placenta in cross-section sessile, elliptical; mesocarp moist but not juicy; exocarp 1–1.5 mm thick; pedicels 8–20 mm long in fruit, 1–1.2 mm thick at mid-point; seeds pale yellow, 2.7–3.1 mm long. **Fig. 32.**

***Specimens examined*: Queensland.** MARANOA DISTRICT: 8 km E of Mungallala, Mar 1960, *Johnson* 1483 (BRI); near 'Boxleigh', *c.* 60 km NE of St George, Apr 2001, *Bean* 17643 & *Pedley* (BRI); 1.1 km W of 'Eulorel', W of Surat, Aug 2001, *Bean* 17747 (BRI, MEL); 'Boxleigh', S of Surat, Aug 2001, *Bean* 17761 (BRI); SW of 'Boxleigh', S of Surat, Aug 2001, *Bean* 17768 (BRI); 'Glen Fosslyn', SW of Glenmorgan, Jan 2002, *Bean* 18368 (BRI); 54 km from Mitchell towards Bollon, Jan 2002, *Bean* 18406 (BRI).

***Distribution and habitat*:** *Solanum argopetalum* is endemic to Queensland. Confined to a limited area of southern Queensland, recorded from Mungallala to the Thomby Range south-east of Surat (**Map 20**). It grows on disturbed sites on low hills and ridges in shallow red sandy to loamy soil, often in association with *Acacia catenulata* (Bendee), *Eucalyptus melanophloia* and *Phebalium glandulosum*.

***Phenology*:** Flowers have been recorded in April and August; mature fruits recorded in August.

***Notes*:** This species is quite distinctive. It does seem fairly close to *S. crassitomentosum* because of its short prickles, unarmed calyx and relatively small flowers, but *S. argopetalum* is easily distinguished by its often gland-tipped stellate hairs with 8–11 lateral rays, the lobed leaves, the long petioles (30–65% of lamina length) and the white corolla.

The populations of *S. argopetalum* so far recorded have all been on disturbed sites. At the type locality, plants were quite common on a strip of roadside land that had been cleared in preparation for the erection of a fence. The species could not be found on the opposite (relatively undisturbed) side of the road, even though the vegetation type was identical.

***Conservation status*:** *S. argopetalum* is currently known from 4 locations, none of which is within a conservation reserve. It is threatened by land clearance and weeds (especially *Cenchrus ciliaris*). Applying the IUCN guidelines (IUCN. 2001), a category of "Vulnerable" is recommended (VU B2ab(iii,v); C1+2a(i)).

***Etymology*:** From the Greek *argos-* white and *petalos-* petals, in reference to the white corolla. Consistently white flowers are found in only a few native Queensland species.

Group 27A (S. hamulosum group), here defined; related to Group 27B (*S. macoorai* group).

Style and ovary bearing abundant stellate hairs (100%); scrambling or vine-like habit (100%); leaves consistently geminate (100%); branchlets with broad recurved prickles (100%); calyx prickles absent (100%); lower leaf surface white or yellowish (100%); inflorescences supra-axillary (100%); inner surface of corolla sparsely to densely stellate-hairy (100%); juvenile leaves (and sometimes adult leaves) with shallow lobes and very numerous prickles (100%); flower buds ovoid (100%).

c. 6 species from Malesia to Australia; 3 species endemic to Australia, all in Queensland.

Symon (1981) included *S. dimorphispinum* and *S. hamulosum* with *S.* sect. *Micracantha* Dunal, a group of species from tropical America. Whalen (1984) pointed out several morphological differences from *S.* sect. *Micracantha*, that precludes any close affinity. Symon (1981) further hypothesised that *S. dimorphispinum* and *S. hamulosum* were both naturalised from an unknown American source. This is untenable, given the close relationship between these species and others from the same part of Queensland, particularly *S. macoorai*, and the presence of related species in Malesia. The Malesian species probably belonging to the *S. hamulosum* group are *S. heteracanthum* Merr. & L.M.Perry and *S. scheferi* F.Muell. from New Guinea, and *S. lianoides* Elmer from Philippines.

53. Solanum dimorphispinum C.T.White, Proc. Roy. Soc. Queensland 50: 82 (1939). **Type:** Queensland. COOK DISTRICT: Mt Spurgeon, September 1936, *C.T. White* 10619 (holo: BRI).

***Illustration*:** Symon (1981: 253)

Erect, rhizomatous perennial shrub or vine, 2–5 m high. Juvenile branchlets with *c.* 20 prickles per dm, 2–3 mm long; leaves (in outline) ovate, shallowly-lobed, with 6–7 pairs of lobes; lamina *c.* 22 × 15 cm, with *c.* 90 prickles on upper surface. Adult branchlets yellow or brown; prickles 15–30 per decimetre, curved, broad-based, 2–6 mm long, 2–5 times longer than wide; stellae sparse to dense, 0.15–0.25 mm diameter, sessile; lateral rays 6–8, porrect; central ray absent; finger hairs absent; Type 2 hairs absent. *Adult leaves* ovate, entire or shallowly lobed throughout; lobes 2–6 on each side, obtuse, lobing index 1–1.3; lamina 10–14.5 cm long, 4.5–7 cm wide, 1.9–2.5 times longer than broad, apex acute or acuminate, base cuneate, oblique part 3–7 mm long, obliqueness index 2–6 percent; petioles 1.3–2.4 cm long, 13–18% length of lamina, prickles absent or present. *Upper leaf surface* green; prickles 0–15, straight, broad-based, 5–7 mm long, prickles absent or present on midvein only or present on midvein and lateral veins; stellate hairs confined to midrib, or distributed throughout; protostellae absent; ordinary stellae very sparse, 0.7–4.5 mm apart, 0.25–0.35 mm across, sessile; lateral rays 7–9, porrect; central ray 0–0.5 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Lower leaf surface* white or yellowish; prickles 0–4, straight, acicular or broad-based, prickles absent or present on midvein only or present on midvein and lateral veins; stellae very dense, *c.* 0.05 mm apart, 0.25–0.35 mm diameter, sessile; lateral rays 7–10, porrect, central ray absent; finger hairs absent; Type 2 hairs absent. *Inflorescence* supra-axillary, pseudo-racemose, common peduncle 0–10 mm long, rachis prickles absent; 5–17-flowered, weakly andromonoecious, flowers 5-merous; pedicels 12–23 mm long at anthesis, same thickness throughout, 0.6–0.9 mm thick at mid-point, prickles absent. Calyx tube 1–3 mm long, lobes deltate, 3–5 mm long; prickles absent at anthesis; stellae very dense, transparent or purple, 0.2–0.3 mm across, sessile, lateral rays 8–10, central ray 0–0.5 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. Corolla mauve, 8–14 mm long, deeply lobed, inner surface sparsely to densely stellate-hairy; anthers 5–6.5 mm long; ovary with stellate hairs only; functional style 7–8.5 mm long, erect, with stellate hairs only, stellae 0.2–0.4 mm across, lateral rays 11–15, central ray 0.5–1 times as long as laterals. *Fruiting calyx* with lobes less than half length of mature fruit, prickles absent. Mature fruits 1–3 per inflorescence, oblate or globular, 30–35 mm diameter, yellow, 2-locular; placenta in cross-section stalked, anvil-shaped; mesocarp moist but not juicy; exocarp 3.8–4.2 mm thick; pedicels 29–39 mm long in fruit, 0.9–1.8 mm thick at mid-point; seeds pale yellow, 2.3–2.8 mm long.

***Specimens examined*:** **Queensland.** COOK DISTRICT: McDowall Range between Mossman and Bloomfield River, May 1969, *Webb & Tracey* 8302 (BRI, CANB); Mt Lewis, Oct 1969, *Webb & Tracey* 8352 (BRI, CANB); T.R.140, Cow L.A., Sep 1973, *Hyland* 6874 (QRS); S.F.143, South Mary L.A., Feb 1974, *Hyland* 7205 (BRI, QRS); 23 miles [37 km] N of Mt Molloy on road to Mossman, Aug 1974, *Swan* 138 (BRI); T.R.66, Oct 1977, *Moriarty* 2278 (BRI); S.F. 143, Kanawarra, Carbine L.A., Oct 1991, *Gray* 5336 (BRI, QRS); Black Mountain, 16°38'S 145°29'E, Jul 1999, *Jago* 5314 *et al.* (BRI); 29.5 km along Mt Lewis road, Mt Lewis Forest Reserve, Nov 2001, *McDonald* KRM1013 (BRI, HO).

***Distribution and habitat*:** *Solanum dimorphispinum* is endemic to Queensland. It is known only from the Mt Lewis and Mt Spurgeon areas (**Map 2**). It inhabits notophyll rainforest at altitudes above 900 metres.

***Phenology*:** Flowers are recorded between May and November; mature fruits in November and December.

***Notes*:** *S. dimorphispinum* is one of the few species for which all stellae lack a central ray. The mature fruits are pale yellow and globose, 30–35 mm diameter. Smaller immature fruits (seen in spirit collection) are quite ellipsoidal in shape.

***Conservation status*:** Currently listed as "Rare" under the Queensland Nature Conservation Act, 1992. The extent of occurrence is small, but the species is not considered at risk.

54. Solanum hamulosum C.T.White, Contr. Arnold Arbor. 4: 95 (1933). **Type:** Queensland. COOK DISTRICT: Boonjie, Atherton Tableland, 23 September 1929, *S.F. Kajewski* 1222 (holo: BRI).

***Illustration*:** Symon (1981: 254)

Erect, perennial vine, 1.5–7 m high. Juvenile branchlets with 30–40 prickles per dm, 2–3 mm long; leaves (in outline) broadly ovate, shallowly-lobed, with 4–6 pairs of lobes; lamina 18–22 cm long, 9–13 cm wide, with 50–100 prickles on upper surface. Adult branchlets grey to rusty or brown; prickles 50–140 per decimetre, curved, broad-based, 1–3.5 mm long, 1–2.5 times longer than wide; stellae very dense, 0.3–0.4 mm diameter, stalks 0–0.4 mm long; lateral rays 7–10, porrect or ascending; central ray 0.5–1 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Adult leaves* ovate, entire; lamina 11–15 cm long, 5–6.5 cm wide, 1.7–2.4 times longer than broad, apex acute or acuminate, base cuneate, obtuse or cordate, oblique part 0–6 mm long, obliqueness index 0–6 percent; petioles 1.9–3.8 cm long, 17–25% length of lamina, prickles present. *Upper leaf surface* green or grey-green; prickles 0–10, straight, broad-based, 2.5–7 mm long, prickles absent or present on midvein only or present on midvein and lateral veins; stellate hairs distributed throughout; protostellae present; ordinary stellae sparse to dense, 0.2–0.3 mm apart, 0.25–0.4 mm across, sessile; lateral rays 6–8, porrect; central ray 0.7–1.2 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Lower leaf surface* white or yellowish; prickles 1–6, curved, broad-based, prickles present on midvein only; stellae dense, 0.1–0.15 mm apart, 0.4–0.5 mm diameter, stalks 0–0.1 mm long; lateral rays 8–9, porrect; central ray 0.7–1.5 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Inflorescence* supra-axillary, pseudo-racemose, common peduncle 0–5 mm long, rachis prickles absent or present; 5–11-flowered, weakly andromonoecious, flowers 5-merous; pedicels 8–18 mm long at anthesis, markedly thicker distally, 0.5–0.6 mm thick at mid-point, prickles absent. Calyx tube 2–3.5 mm long, lobes deltate, 2–3.5 mm long; prickles absent at anthesis; stellae dense to very dense, white, brown or rusty, 0.25–0.5 mm across, stalks 0–0.2 mm long, lateral rays 7 or 8, central ray 0.7–1.2 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. Corolla mauve, 9–15 mm long, shallowly or deeply lobed, inner surface sparsely stellate-hairy; anthers 4.5–6 mm long; ovary with stellate hairs only; functional style 8–8.5 mm long, erect, with stellate hairs only, stellae 0.3–0.5 mm across, lateral rays 6–8, central ray 0.7–1.2 times as long as laterals. *Fruiting calyx* with lobes less than half length of mature fruit, prickles absent. Mature fruits 1 or 2 per inflorescence, globular, 13–15 mm diameter, yellowish-green or green, 2-locular; placenta in cross-section sessile, semi-circular, or stalked, anvil-shaped; mesocarp moist but not juicy; exocarp 0.8–1 mm thick; pedicels 18–25 mm long in fruit, 0.8–1.2 mm thick at mid-point; seeds pale yellow, 2–2.5 mm long. *Dirran Curse.*

***Specimens examined*:** **Queensland.** COOK DISTRICT: Tarzali, the Dirran and Russell River road, Feb 1918, *White s.n.* (BRI); Millaa Millaa, Sep 1937, *Henry s.n.* (QRS); R310, Boonjie, Aug 1961, *Hyland* AFO 2041 (QRS); near Boonjie, May 1967, *Symon* 4750 (BRI); Davies Creek S.F., Aug 1973, *Moriarty* 1371 (BRI, CANB); western foothills of Mt Bartle Frere, Aug 1973, *Moriarty* 1434 (BRI, CANB); S.F.755, T.R.1230, Boonjie L.A., Dec 1974, *Irvine* 1094 (BRI, QRS); Herberton Range, McKell Road turnoff, Aug 2003, *McDonald* KRM1165 (BRI). NORTH KENNEDY DISTRICT: Ravenshoe, Sep 1937, *Brass & White* 132 (BRI); Keogh's block, 'Bellview', Evelyn, Jan 1974, *Collins* C74-12 (BRI);

S.F.194, Parish of Herberton, Dec 1991, *Hyland* 14421 (BRI, QRS).

Distribution and habitat**:** *Solanum hamulosum* is endemic to Queensland, and known only from the Atherton Tableland (**Map 21**). It grows in notophyll rainforest on basaltic soils, between 600–1100 metres altitude.

Phenology**:** Flowers are recorded between August and December; mature fruits in November and December.

Notes**:** *S. hamulosum* and *S. dimorphispinum* are very similar in habit, habitat, leaf size and prickle shape. They can readily be distinguished on characters of the stellate hairs, but it was not known whether these differences correlated to differences on other organs of the plant. During this study I was able to procure mature fruits of both species; those of *S. dimorphispinum* are 30–35 mm in diameter, while those of *S. hamulosum* are only 13–15 mm diameter. This correlation is seen as a vindication for using stellate hair morphology in diagnosing and separating *Solanum* taxa where there is incomplete data about the flowering or fruiting characters. The hairs are always available for study, and are unaffected by drying or preserving. Many other useful characters are rarely available or visible only on fresh material, or difficult to determine from dried specimens.

Conservation status**:** Currently listed as "Rare" under the Queensland Nature Conservation Act, 1992.

Solanum hamulosum was considered a weed of secondary regrowth during the 1930's and 1940's, when the rainforests of the Atherton Tableland were being cleared, and was called 'Dirran Curse'. Now, little of the original habitat remains, and the species is exceedingly difficult to locate. The rainforest edges (the most likely habitat) are usually swathed in *Lantana camara*. Applying the IUCN guidelines (IUCN. 2001), a category of "Endangered" is recommended (EN B1ab(iii,iv,v)+2ab(iii,iv,v); C1).

55. Solanum eminens A.R.Bean **sp. nov.** Vitis perennis vel frutex scandens; folia adulta viridia, late ovata, non profunde lobata, aculeis utrinque rectis numerosis; ramuli moderate aculeati (70–90 per dm.), aculei curvi, ad basim lati; inflorescentia pseudo-racemosa, 7–10-flora; ovarium tantum pilis stellatis praeditum; calycis aculei absentes; fructus maturi aurantiaci, pedicellis 23–28 mm longis. **Typus:** Queensland. Cook District: Bellenden Ker Range, 11 October 1974, *B. Hyland* 7772 (holo: BRI; iso: QRS).

Sprawling perennial vine, 1–2 m high. Juvenile stage unknown. Adult branchlets brown; prickles 70–90 per decimetre, curved, broad-based, 2–4 mm long, 2.5–4 times longer than wide; stellae sparse to dense, 0.2–0.3 mm diameter, stalks 0–0.1 mm long; lateral rays 7 or 8, porrect; central ray 0.4–0.8 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Adult leaves* broadly ovate, shallowly lobed throughout; lobes 5–7 on each side, acute, lobing index 1.1–1.3; lamina 8–12 cm long, 5–7.5 cm wide, 1.4–1.8 times longer than broad, apex acute or acuminate, base cuneate, oblique part 0–7 mm long, obliqueness index 0–7 percent; petioles 1.6–3 cm long, 20–30% length of lamina, prickles present. *Upper leaf surface* green; prickles 40–120, straight, acicular, 3–11 mm long, prickles present on midvein and lateral veins; stellate hairs distributed throughout; protostellae absent; ordinary stellae very sparse to sparse, 0.6–1.4 mm apart, 0.2–0.35 mm across, sessile; lateral rays 7 or 8, porrect; central ray 0.5–1 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Lower leaf surface* white or yellowish; prickles 15–30, straight, acicular or broad-based, prickles present on midvein and lateral veins; stellae dense to very dense, 0.05–0.2 mm apart, 0.25–0.35 mm diameter, sessile; lateral rays 7 or 8, porrect; central ray 0.3–0.6 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Inflorescence* supra-axillary, pseudo-racemose, common peduncle 6–12 mm long, rachis prickles absent or present; 7–10-flowered, weakly andromonoecious, flowers 5-merous; pedicels 12–18 mm long at anthesis, same thickness throughout, 0.5–0.6 mm thick at mid-point, prickles absent or present. Calyx tube 2.5–3.5 mm long, lobes deltate or rostrate, 0.5–3 mm long; prickles absent at anthesis; stellae dense, yellow or white or purple, 0.2–0.3 mm across, sessile, lateral rays 7 or 8, central ray 0.4–1 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. Corolla

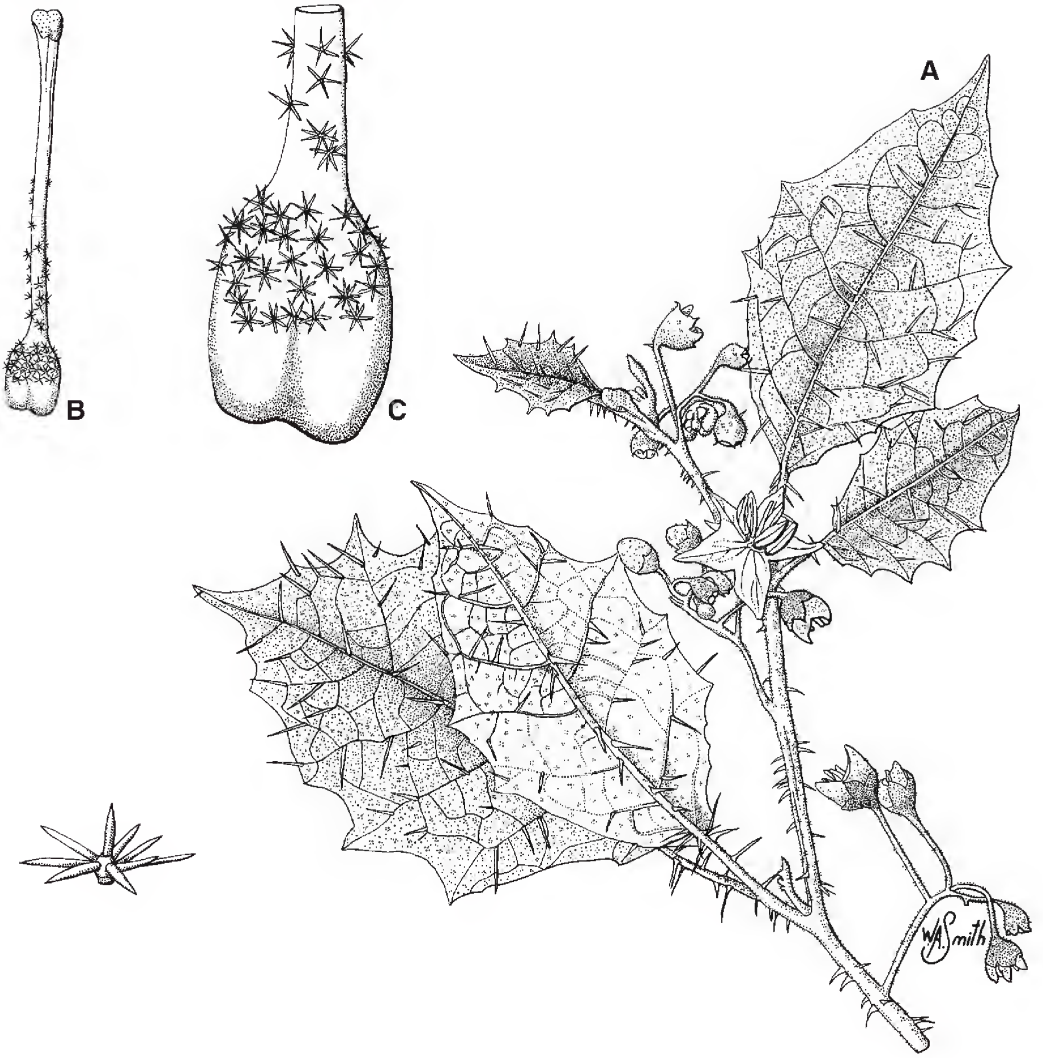


Fig. 33. ***Solanum eminens***. A. flowering branchlet × 0.8. B. ovary and style × 6. C. ovary with stellate hairs × 20. D. stellate hair, upper leaf surface × 60. A, D, *Powell* 796 *et al.*; B–C, *Clarkson* 6575.

mauve, 9–14 mm long, deeply lobed, inner surface sparsely stellate-hairy; anthers 5.5–6.5 mm long; ovary with stellate hairs only; functional style *c.* 8.5 mm long, erect, with stellate hairs only, stellae *c.* 0.2 mm across, lateral rays 6–8, central ray *c.* 1 times as long as laterals. *Fruiting calyx* with lobes less than half length of mature fruit, prickles absent. Mature fruits 1 per inflorescence, *c.* 17 mm diameter, orange; pedicels 23–28 mm long in fruit, 1–1.3 mm thick at mid-point; seeds pale yellow, 1.9–2.4 mm long. **Fig. 33.**

***Specimens examined*: Queensland.** COOK DISTRICT: Bellenden Ker, Nov 1972, *Hyland* 6584 (BRI, QRS); Bellenden Ker Range, Oct 1974, *Hyland* 7757 (BRI, CANB, QRS); summit of Bellenden Ker, S of Cairns, Sep 1977, *Powell* 796 *et al.* (BRI, NSW); Mount Bellenden Ker, near the cableway terminus, Sep 1986, *Clarkson* 6575 (AD, BRI, MBA, QRS); central peak of Bellenden Ker, Wooroonooran N.P., Jun 1995, *Hunter* JH5302 (BRI).

Distribution and habitat: *Solanum eminens* is endemic to Queensland. Apparently confined to the highest altitudes (above 1500 metres) on Mt Bellenden Ker (**Map 23**), in wet microphyll to notophyll fern forest.

***Phenology*:** Flowers are recorded in October; mature fruits in June and November

***Notes*:** Two collectors have independently stated that the mature fruit colour is orange.

Solanum eminens differs significantly from *S. hamulosum* by the adult leaves that have 5–7 pairs of conspicuous acute lobes, and with 40–120 prickles on the upper leaf surface (leaves entire, 0–10 prickles for *S. hamulosum*); the very sparse to sparse indumentum of the upper leaf surface (moderate to dense indumentum for *S. hamulosum*); the stellae of the lower leaf surface 0.25–0.35 mm diameter with central ray 0.3–0.6 times as long as laterals (0.4–0.5 mm diameter and central ray 0.7–1.5 times as long as laterals for *S. hamulosum*) and the orange mature fruit (green for *S. hamulosum*).

***Conservation status*:** *S. eminens* is known only from the highest parts of Mt Bellenden Ker in Wooroonooran N.P. It is threatened by low population size and restricted area of occupancy. Applying the IUCN guidelines (IUCN. 2001), a category of “Vulnerable” is recommended (VU D1).

***Etymology*:** From the Latin, *eminens* meaning “projecting, high”. This is in reference to the altitude at which this species grows (1500–1600 metres), the highest for any Australian *Solanum*.

Group 27B (S. macoorai group) = Group 6 of Whalen (1984)

Calyx not accrescent in fruit (100%); inflorescences andromonoecious, male flowers and bisexual flowers same size and prickliness (100%); branchlet stellae not gland-tipped (100%); branchlet finger hairs absent (100%); mature fruits green to yellowish-green (94%); branchlet prickles acicular (89%); adult leaves entire or shallowly lobed (87%); seeds white to pale yellow (83%); adult leaves entire (78%); calyx without prickles (77%); rhizomatous perennial shrubs (72%); inner surface of corolla stellate-hairy (71%).

24 species endemic to Australia, 18 species indigenous to Queensland and north-eastern N.S.W.

56. Solanum macoorai F.M.Bailey, Queensland Dept. Agric. Bull. 8: 80 (1893). **Type:** Queensland. COOK DISTRICT: summit of south peak, Mt Bellenden-Ker, June 1889, *F.M. Bailey s.n.* (holo: BRI).

***Illustration*:** Symon (1981: 241)

Erect, rhizomatous perennial shrub, 1–4 m high. Juvenile branchlets with 90–200 prickles per dm, 2–12 mm long; leaves (in outline) ovate, shallowly-lobed, with 7–9 pairs of lobes; lamina *c.* 12 × 5 cm, with 100–150 prickles on upper surface. Adult branchlets yellow, rusty or brown; prickles absent or present, 0–55 per decimetre, straight, acicular, 3–7 mm long, 7–12 times longer than wide; stellae sparse to dense, 0.15–0.25 mm diameter, sessile; lateral rays 6–8, porrect; central ray absent or present, 0–0.2 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Adult leaves* elliptical or ovate, entire or shallowly lobed throughout; lobes 3–5 on each side, acute or obtuse, lobing index 1–1.2; lamina 9–16 cm long, 3–7.5 cm wide, 2.1–3.2 times longer than broad, apex acute or acuminate, base cuneate or obtuse, oblique part 0–9 mm long, obliqueness index 0–6 percent; petioles 1.4–2.6 cm long, 10–18% length of lamina, prickles absent. *Upper leaf surface* green; prickles 0–80, straight, acicular, 3–8 mm long, prickles absent or present on midvein only or present on midvein and lateral veins; stellate hairs confined to midrib, or distributed throughout; protostellae absent; ordinary stellae very sparse, 0.8–5 mm apart, 0.2–0.3 mm across, sessile; lateral rays 6–8, porrect; central ray 0–0.5 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Lower leaf surface* green; prickles 0–16, straight, acicular, absent or present on midvein only or present on midvein and lateral veins; stellae very sparse to moderate, 0.2–0.5 mm apart, 0.2–0.3 mm diameter, sessile; lateral rays 7–10, porrect; central ray 0–0.3 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Inflorescence* supra-axillary, pseudo-racemose, common peduncle 1–7 mm long, rachis prickles absent; 7–30-flowered, weakly andromonoecious, flowers 5-merous; pedicels 6–12 mm long at anthesis, markedly thicker distally, 0.4–0.7 mm thick at mid-point, prickles absent. Calyx tube

2–4 mm long, lobes deltate or rostrate, 1.8–3.5 mm long; prickles absent at anthesis; stellae dense to very dense, yellow, transparent or purple, 0.2–0.25 mm across, sessile, lateral rays 6–9, central ray 0–1 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. Corolla mauve or purple, 8–10 mm long, deeply lobed, inner surface sparsely stellate-hairy; anthers 4–5.5 mm long; ovary with stellate hairs only, or with stellate and Type 2 hairs; functional style 5–7 mm long, erect, with stellate hairs only or with stellate and Type 2 hairs, stellae 0.25–0.4 mm across, lateral rays 7–9, central ray 0.5–2 times as long as laterals. *Fruiting calyx* with lobes less than half length of mature fruit, prickles absent. Mature fruits 1 or 2 per inflorescence, globular, 23–25 mm diameter, red or orange, 2-locular; placenta in cross-section stalked, anvil-shaped; mesocarp moist but not juicy; exocarp 4.7–5 mm thick; pedicels 22–31 mm long in fruit, 1.1–1.8 mm thick at mid-point; seeds pale yellow, 3–3.6 mm long.

***Specimens examined*:** **Queensland.** COOK DISTRICT: Johnstone River, Jul 1917, *Michael* (BRI); Boonjie, Atherton Tableland, *anno* 1929, *Kajewski* 1255 (BRI); Lake Barrine, Jul 1938, *Goy* 432 (BRI); near Mt Haig, *c.* 12 miles [19 km] SE of Mareeba, May 1969, *Tracey s.n.* (BRI); Mt Bellenden Ker, *c.* 1 mile [1.6 km] SE of Centre Peak, Jun 1969, *Smith* 14682 (BRI); Pine Creek Forestry road, Malbon Thompson Range, Jul 1973, *Webb & Tracey* 13383 (BRI, QRS); SW slopes of May Peak, ESE of Cairns, Sep 1974, *Moriarty* 1580 (BRI, CANB); S.F.607, West L.A., Dec 1974, *Hyland* 7903 (BRI); Mt Bartle Frere, 1.8 km WSW of Bobbin Bobbin Falls, Nov 1988, *Jessup* GJM1077 *et al.* (BRI); S.F.194 Herberton Range, *c.* 9.5 km S of Rifle Range road turnoff, Aug 1989, *Bostock* 1023 & *Guymer* (BRI); S.F.185 Danbulla, Breach L.A., Dec 1991, *Gray* 5361 (BRI, QRS); Smiths Track, Barron Gorge N.P., Apr 1997, *Jago* 4327 (BRI); S.F.144, Chowchilla L.A., Sep 2000, *Ford* 2428 (BRI); Wooroonooran N.P., East Mulgrave River, Nov 2000, *Forster* PIF26433 *et al.* (A, BRI, MEL). NORTH KENNEDY DISTRICT: Koolmoon Creek, Sep 1959, *Smith* 10809 (BRI); ‘Bellview’, Evelyn, Jan 1974, Collins C74-5 (BRI); Kirrama Range, S.F.344, *c.* 38 km NW of Kennedy, Nov 1989, *Fell* DF2006 (AD, BRI, MEL); Koombooloomba S.F., near Tully Falls road, S of Ravenshoe, Apr 2002, *Bean* 18717 & *McDonald* (BRI, MEL).

***Distribution and habitat*:** *Solanum macoorai* is endemic to Queensland, extending from Windsor Tableland (near Mount Carbine) to the Kirrama Range near Cardwell (**Map 22**). It occurs in notophyll rainforest or the ecotone between eucalypt forest and rainforest, in high rainfall areas. Altitude is commonly between 500 and 1500 metres, but it extends almost to sea level in some places.

***Phenology*:** Flowers and fruits are recorded for almost every month of the year.

***Notes*:** *S. macoorai* is closely related to *S. magnifolium*, but differs by the juvenile plants with longer and more abundant prickles; adult leaves usually lobed and bearing prickles, and with sparser indumentum on the lower surface; the stellae (on all organs) with a much shorter central ray, and stellae of the lower leaf surface lacking a central ray; and fruits red or orange at maturity (*vs.* yellow).

In the protologue, Bailey described the fruit of *S. macoorai*, but no trace of this (these) fruit(s) can now be found at BRI. The holotype comprises 4 detached leaves mounted on a single sheet. Fortunately the very distinctive indumentum pattern on the leaves of *S. macoorai* means that there is no doubt about the correct application of the name.

***Conservation status*:** Widespread. Not considered at risk.

57. Solanum magnifolium F.Muell., Fragm. 6: 27 (1867); *S. stelligerum* var. *magnifolium* (F.Muell.) Benth., Fl. Austral. 4: 451 (1868). **Type:** Queensland. NORTH KENNEDY DISTRICT: Murray River [N of Cardwell], August 1867, *J. Dallachy s.n.* (holo: MEL [MEL11658]).

Solanum dallachii Benth., Fl. Austral. 4: 456 (1868), **syn. nov. Type:** Queensland. NORTH KENNEDY DISTRICT: Rockingham Bay, *anno* 1864, *J. Dallachy* (lecto: K; isolecto: MEL [MEL11655, MEL11659]), *fide* Symon (1981), but see discussion below.

[*Solanum repandum* auct. non G. Forster: F. Muell., Fragm. 6: 145 (1868)].

***Illustration*:** Symon (1981: 246), as *S. dallachii.*

Erect, rhizomatous perennial shrub, 1.5–4 m high. Juvenile branchlets with 30–50 prickles per dm, 4–5 mm long; leaves (in outline) ovate, shallowly-lobed, with 4 or 5 pairs of lobes; lamina 9.5–11.5 cm long, 4.3–5.5 cm wide, with 20–40 prickles on upper surface. Adult branchlets yellow, rusty or brown; prickles absent or present, 0–25 per decimetre, straight, acicular or broad-based, 1.5–5.5 mm long, 7–10 times longer than wide; stellae dense, 0.2–0.3 mm diameter, sessile; lateral rays 7 or 8, porrect; central ray 3–6 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Adult leaves* elliptical or ovate, entire or shallowly lobed throughout; lobes 4–6 on each side, obtuse, lobing index 1–1.1; lamina 9–18 cm long, 4–8 cm wide, 2.2–2.7 times longer than broad, apex acute or acuminate, base cuneate, oblique part 0–4.5 mm long, obliqueness index 0–3 percent; petioles 1–3.5 cm long, 8–19% length of lamina, prickles absent. *Upper leaf surface* green; prickles 0–10, straight, acicular, 1–4 mm long, prickles absent or present on midvein only or present on midvein and lateral veins; stellate hairs confined to midrib, or distributed throughout; protostellae absent; ordinary stellae very sparse to sparse, 0.25–1 mm apart, 0.2–0.3 mm across, sessile; lateral rays 6–8, porrect; central ray 4–8 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Lower leaf surface* yellowish; prickles absent; stellae moderate to very dense, 0.05–0.3 mm apart, 0.25–0.4 mm diameter, sessile; lateral rays 7 or 8, porrect; central ray 1.5–3 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Inflorescence* supra-axillary, pseudo-racemose, common peduncle 2–8 mm long, rachis prickles absent; 6–18-flowered, weakly andromonoecious, flowers 5-merous; pedicels 4–10 mm long at anthesis, same thickness throughout, 0.4–0.7 mm thick at mid-point, prickles absent. Calyx tube 1.5–2.5 mm long, lobes deltate, 3–4 mm long; prickles absent at anthesis; stellae very dense, yellow or brown or rusty, 0.25–0.35 mm across, sessile, lateral rays 7 or 8, central ray 3–6 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. Corolla mauve or purple, 6–11 mm long, deeply lobed, inner surface sparsely stellate-hairy; anthers 3.5–4.5 mm long; ovary with stellate hairs only; functional style *c.* 6 mm long, erect, with stellate hairs only, stellae 0.25–0.3 mm across, lateral rays *c.* 8, central ray 1.5–3 times as long as laterals. *Fruiting calyx* with lobes less than half length of mature fruit, prickles absent. Mature fruits 1 per inflorescence, globular, 20–27 mm diameter, yellow or yellowish-green, 2-locular; placenta in cross-section stalked, anvil-shaped; mesocarp moist but not juicy; exocarp 4.5–6 mm thick; pedicels 19–23 mm long in fruit, 1.2–2.5 mm thick at mid-point; seeds pale yellow, 2.7–3.1 mm long.

***Specimens examined*: Queensland.** Cook District: Endeavour River, Sep 1872, *Hann* (BRI); Upper Parrot Creek, Annan River, Sep 1948, *Brass* 20283 (BRI); *c.* 6 miles [10 km] SW of Yungaburra, Curtain Fig site, Dec 1968, *Tracey s.n.* (BRI); between Macnamee Ck and Downey Ck, W of Innisfail, May 1972, *Webb & Tracey* 10755 (BRI); Macdowall Range between Daintree River and China Camp, Aug 1972, *Webb & Tracey* 10752 (BRI); Mt Sampson W of The Forks on Cooktown–Bloomfield road, Jun 1973, *Webb & Tracey* 10793 (BRI, CANB); T.R.55, Jul 1974, *Hyland* 7342 (BRI); S.F.144, Fantail L.A., Mar 1981, *Unwin* 823 (QRS); S.F.756 Jordan, Lower Downey L.A., Nov 1991, *Hyland* 14332 (BRI, QRS); Daintree N.P., Adeline Creek headwaters, top of hill 929, May 1999, *Forster* PIF24543 & *Booth* (BRI); T.R.176, Shipton L.A., Oct 1999, *Forster* PIF25007 & *Booth* (BRI, QRS); Shipton's Flat, S of Cooktown, Apr 2002, *Bean* 18775 & *McDonald* (BRI). North Kennedy District: Herbert River, *anno* 1873, *Stone* (BRI); Koombooloomba on road S towards Tully River crossing, May 1972, *Webb & Tracey* 10907 (BRI); Echo Creek walking track, off North Davidson road, west of Tully, Aug 2002, *Ford* AF3564 & *Holmes* (BRI, NSW).

***Distribution and habitat*:** *Solanum magnifolium* is endemic to Queenland. It extends from Cooktown to S of Ravenshoe. There are historical records (including the type) from the Ingham and Cardwell areas (**Map 24**). It inhabits rainforest margins or where rainforest is invading adjacent eucalypt forest. Altitude ranges from 100–900 metres.

***Phenology*:** Flowers are recorded for May and from August–November; mature fruits for March and May and September–December.

***Notes*:** Mueller's description of *S. 'repandum'* in Fragmenta 6: 145 is based on 3 collections made by Dallachy in 1864. One of these specimens has a label that states the plant is "12 feet high" and has "fruits yellow". Mueller repeats these statements in his description. Another specimen has a strip of bark taken from an older stem that bears numerous short prickles. The leafy specimen is without prickles. Mueller in his description, states that the branchlets of *S. repandum* are on one part conspicuously aculeate, in another part unarmed. Bentham named *S. dallachii* in December 1868, in what amounts to a *nom. nov.* for *S. repandum* F.Muell. *non* G.Forst., and the same specimens serve as types for *S. dallachii.*

Symon (1981) chose as lectotype of *S. dallachii* one of the sheets at K. Furthermore, he cited three MEL sheets as isolectotypes. While the sheet MEL11655 and its duplicate (MEL11659) may well be isolectotypes, the sheet MEL 11656 certainly is not as its label clearly shows that the date and locality of collection are different.

Mueller (1867) named *Solanum magnifolium*, based on a Dallachy specimen or specimens. The exact identity of the type specimen(s) has until now been unclear. A specimen collected by Dallachy from "Murray River" in August 1867 (MEL11658), precisely matches the details given in the protologue. In particular, this specimen has unusually small prickles on the branchlets (2–3 mm long), the leaves of the specimen are very large (up to 20 × 11 cm), and there are no fruits. These characteristics are confirmed in the protologue (*aculei* 1–1.5'" *longi*; *foliis ad* 9" *longa, ad* 5" *lata*; and "*baccae ignotae*"). The repand-dentate leaves, calyx length and anther length offer further confirmation that Mueller's description was taken from this specimen, and this specimen alone.

Significantly, Bentham (1868) cited Dallachy's "Murray River" specimen when reducing *S. magnifolium* to a variety of *S. stelligerum* Sm., thereby confirming that this was the specimen used by Mueller to describe his species.

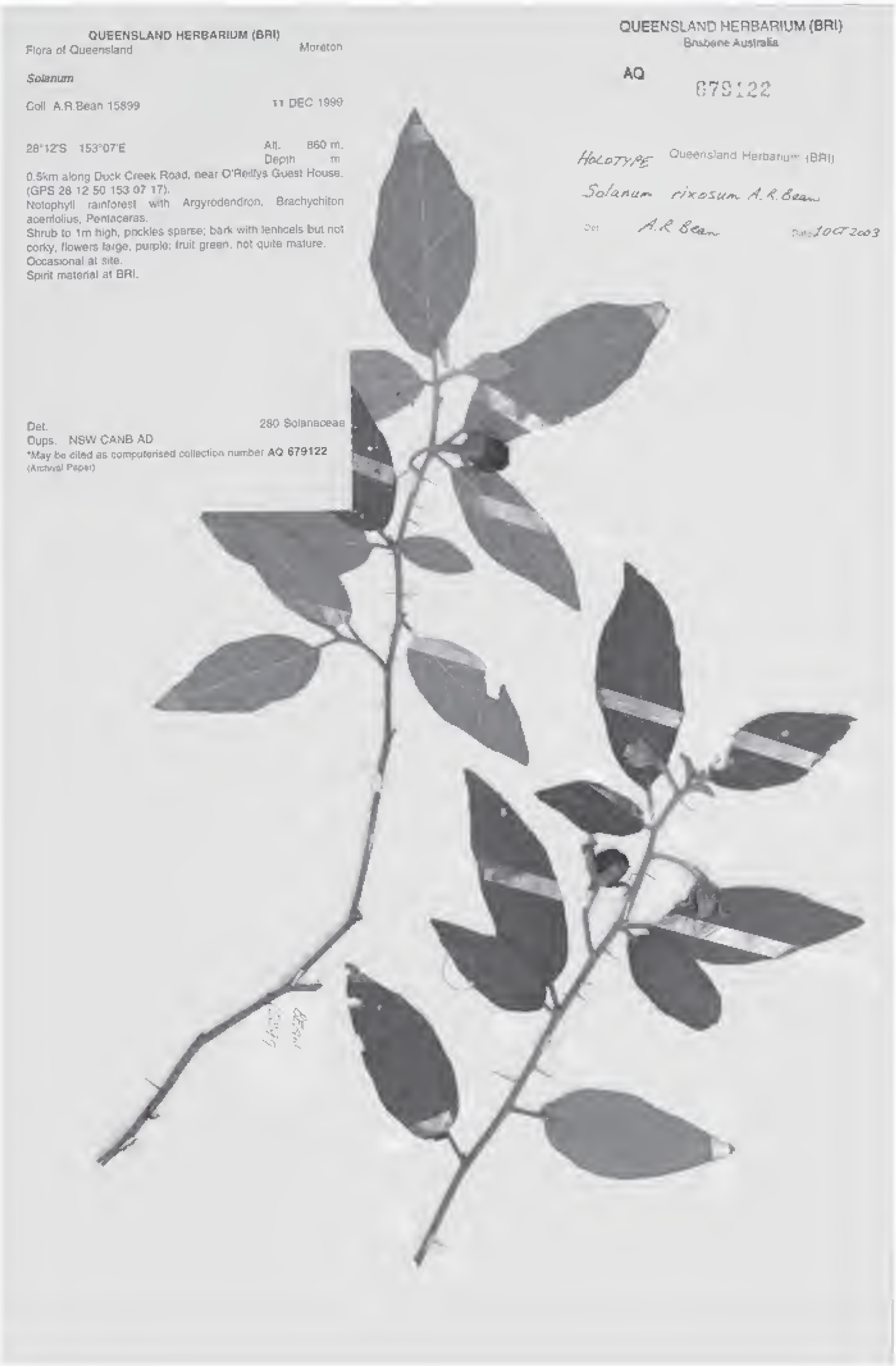
***Conservation status*:** Although not seen in the Ingham–Cardwell area (the type locality) for 130 years, *S. magnifolium* appears to be moderately common further north, particularly around Bloomfield. No conservation code is recommended.

58. Solanum rixosum A.R.Bean **sp. nov.** Frutex perennis, erectus; folia ovata, integra vel non profunde lobata; aculei in ramulis sparsi; cortex tenuis nondescriptus; pili digitati pagina superiore folii absentes; calycis aculei absentes; pagina interna corollae sparse stellato-pilosa; ovarium pilis stellatis et Type-2 praeditum; fructus maturi virides, 19–24 mm diametro; pedicellis fructiferis 17–26 mm longis. **Typus:** Queensland. Moreton District: 0.5 km along Duck Creek road, near O'Reillys Guest House, 11 December 1999, *A.R. Bean* 15899 (holo: BRI (1 sheet + spirit); iso: AD, CANB, NSW).

Solanum sp. 1 in Ross (1986); *Solanum* sp. (Benarkin R.J. Henderson H297) in Henderson (2002).

***Illustration*:** Symon (1981: 248), as *S. furfuraceum.*

Erect, rhizomatous perennial shrub, 1–2 m high. Juvenile branchlets with 10–30 prickles per dm; leaves (in outline) broadly ovate, shallowly-lobed, with 1–3 pairs of lobes; lamina 9–15 cm long, 4–8 cm wide, with 10–40 prickles on upper surface. Adult branchlets yellow or rusty; prickles absent or present, 0–15 per decimetre, straight, acicular, 3–10 mm long, 10–14 times longer than wide; stellae very dense, 0.3–0.4 mm diameter, stalks 0–0.2 mm long; lateral rays 4–8, porrect; central ray 1–2 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Adult leaves* ovate, entire or shallowly lobed throughout; lobes 1–3 on each side, obtuse, lobing index 1–1.3; lamina 6–12 cm long, 2.9–4.8 cm wide, 1.8–2.6 times longer than broad, apex acute, base cuneate or obtuse, oblique part 0–4 mm long, obliqueness index 0–4 percent; petioles 0.7–1.4 cm long, 8–14% length of lamina, prickles absent. *Upper leaf surface* green; prickles 0–10, straight, acicular, 4–10 mm long, prickles absent or present on midvein only or present on midvein and lateral veins; stellate hairs distributed throughout; protostellae absent; ordinary stellae very sparse to sparse, 0.7–1.6 mm apart, 0.4–0.8 mm across, stalks 0–0.2 mm long; lateral rays 6–9, porrect or ascending; central ray 1–1.5 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Lower leaf surface* yellowish; prickles absent; stellae dense, 0.1–0.4 mm apart, 0.5–0.8 mm diameter, stalks 0.2–0.6 mm long; lateral rays 7–9, porrect; central ray 1–1.5 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Inflorescence* supra-axillary, pseudo-racemose, common peduncle 1–6 mm long, rachis prickles absent; 2–15-flowered, weakly andromonoecious, flowers 5-merous; pedicels 6–11 mm long at anthesis, same thickness throughout, 0.5–0.8 mm thick at mid-point, prickles absent. Calyx tube 1.5–3 mm long, lobes attenuate, 7–9 mm long; prickles absent at anthesis; stellae very dense, yellow or brown or rusty, 0.5–0.6 mm across, stalks 0–0.2 mm long, lateral rays 8–9, central



QUEENSLAND HERBARIUM (BRI)
Flora of Queensland Moreton

Solanum

Coll A.R.Bean 15899 11 DEC 1999

28°12'S 153°07'E Alt. 860 m.
Depth m

0.5km along Duck Creek Road, near O'Reillys Guest House. (GPS 28 12 50 153 07 17).
Notophyll rainforest with Argyrodendron, Brachychiton acerifolius, Pentaceras.
Shrub to 1m high, prickles sparse; bark with lenticels but not corky, flowers large, purple; fruit green, not quite mature.
Occasional at site.
Spirit material at BRI.

Det. 280 Solanaceae
Dups. NSW CANB AD
*May be cited as computerised collection number AQ 679122
(Archival Paper)

QUEENSLAND HERBARIUM (BRI)
Brisbane Australia

AQ 679122

HOLOTYPE Queensland Herbarium (BRI)
Solanum rixosum A.R.Bean
Det A.R.Bean Date 10 OCT 2003

Fig. 34. Holotype of ***Solanum rixosum***.

ray 1–1.5 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. Corolla purple, 9–14 mm long, shallowly lobed, inner surface sparsely stellate-hairy; anthers 5–6 mm long; ovary with stellate and Type 2 hairs; functional style 7.5–10 mm long, erect, glabrous or with Type 2 hairs only or with stellate and Type 2 hairs, stellae 0.4–0.5 mm across, lateral rays 6–9, central ray 1–1.5 times as long as laterals. *Fruiting calyx* with lobes less than half length of mature fruit, prickles absent. Mature fruits 1–3 per inflorescence, globular, 19–24 mm diameter, yellowish-green or green, 2 or 3-locular; placenta in cross-section stalked, anvil-shaped; mesocarp moist but not juicy; exocarp 0.9–1.2 mm thick; pedicels 17–26 mm long in fruit, 1–1.4 mm thick at mid-point; seeds pale yellow, 2.2–2.7 mm long. **Fig. 34.**

***Specimens examined*: Queensland.** Burnett District: Bunya Mtns, Oct 1919, *White s.n.* (BRI); Bunya Mountains, Oct 1958, *Mitchener* (BRI); 2.5 km E of Mt Mowbullan, Bunya Mountains, Sep 1988, *Forster* PIF5795 & *Bird* (AD, BRI, MEL). Wide Bay District: Blackall Range, May 1910, *Keys* (BRI); Blackall Range, Dec 1916, *White s.n.* (BRI); Conondale Range (S.F.274 Conondale), Booloumba L.A., Oct 1982, *McDonald* 3575 & *Williams* (BRI, MEL, NSW); Mt Glastonbury, Sep 1986, *Sharpe* 4515 & *Bean* (BRI); Peters L.A., Conondale Ranges, Nov 1990, *Bean* 2694 (BRI). Darling Downs District: Cunninghams Gap, undated, *Bailey* (BRI); Killarney, Oct 1891, *coll. unknown* (BRI); Westcott, Bunya Mountains, Feb 1995, *Fairfax* 61 (BRI); 800 m S of Cherry Plain picnic area [Bunya Mountains], Nov 1996, *Holland* 1147 (BRI). Moreton District: Peecheys [Ashgrove, Brisbane], Aug 1888, *Simmonds* (BRI); Rosewood, May 1918, *White s.n.* (BRI); Tamborine Mtn, Dec 1921, *White* 1789 (BRI); Blackbutt Range near Moore, May 1967, *Griffin* (BRI); Benarkin S.F., *c.* 15 miles [24 km] E of Yarraman, May 1967, *Henderson* H253 (BRI); Levers Plateau, on Qld/N.S.W. border, *c.* 90 km SSW of Brisbane, Apr 1972, *Henderson* H1284 (BRI); D'Aguilar Range, NW of Brisbane, Apr 1972, *Moriarty* 906 (BRI); Ravensbourne, N of Toowoomba, Nov 1985, *Swarbrick* 8337 (BRI); S.F.809 Laceys Creek, D'Aguilar Range, Oct 1993, *Forster* PIF13992 (AD, BRI, K, MEL, QRS); 3.2 km along Duck Creek road, near O'Reillys Guest House, Jan 2000, *Bean* 15970 (BRI, NSW). **New South Wales.** North Coast: Toonumbar S.F., *c.* 26 km NW of Kyogle, Feb 1972, *Henderson* H1266, H1267 & *Parham* (BRI); Eden Creek Falls, Toonumbar S.F., Sep 1972, *Coveny* 4410 (BRI, NSW); lower slope of Mt Lindesay, 7 miles [11 km] ENE of Woodenbong, Sep 1972, *Coveny* 4542 & *Rodd* (BRI, NSW).

***Distribution and habitat*:** *Solanum rixosum* has a rather limited extent, from the Bunya Mountains and Mt Glastonbury in Queensland to the Kyogle district of far north-eastern New South Wales (**Map 21**). It grows in disturbed areas of notophyll rainforest, or in shrubby eucalypt forest close to rainforest.

***Phenology*:** Flowers are recorded for April and May and from August–December; mature fruits from November–May.

***Notes*:** *Solanum rixosum* is related to *S. furfuraceum*, but differs by the thin, non-descript bark; the stellae of the upper leaf surface very sparse to sparse; the fruiting pedicels 17–26 mm long (*vs.* 4–8 mm long for *S. furfuraceum*); the ovary with both stellate and Type 2 hairs; the calyx without Type 2 hairs, and the fruiting exocarp 0.9–1.2 mm thick (2–2.6 mm thick for *S. furfuraceum*).

S. rixosum differs from *S. magnifolium* by the larger stellae with a relatively shorter central ray, stellae stalked on the lower leaf surface, adult leaves (when lobed) with only 1–3 pairs of lobes, the thinner exocarp of the fruit and the broadly ovate juvenile leaves.

***Conservation status*:** Still moderately common in some areas, and not currently considered at risk.

***Etymology*:** From the Latin *rixosus* meaning quarrelsome. This refers to the differences of opinion of various botanists regarding the taxonomic status of this species.

59. Solanum serpens A.R.Bean, Austrobaileya 6: 248 (2002). **Type:** Queensland. Moreton District: Cainbable Creek track, Lamington National Park, 11 December 1999, *A.R. Bean* 15903 (holo: BRI; iso: CANB, MEL, NSW).

Solanum stelligerum var. *procumbens* C.T.White, Proc. Roy. Soc. Queensland 55: 72 (1944). **Type:** Queensland. Moreton District: Lamington National Park, 27 November 1942, *C.T. White* 11889 (holo: BRI, 2 sheets).

***Illustration*:** Bean (2002b: 249)

Prostrate, stoloniferous perennial shrub, 0–0.3 m high. Juvenile stage absent. Adult branchlets grey or rusty; prickles 15–35 per decimetre, straight, acicular, 3–6 mm long, 10–14 times longer than wide; stellae dense, 0.25–0.35 mm diameter, sessile; lateral rays 7 or 8, porrect; central ray 4–9 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Adult leaves* elliptical, ovate or broadly ovate, entire; lamina 5.5–10 cm long, 2.5–4 cm wide, 1.4–2.9 times longer than broad, apex obtuse or acute, base cuneate or obtuse, oblique part 0–3 mm long, obliqueness index 0–4 percent; petioles 0.6–1.5 cm long, 10–19% length of lamina, prickles present. *Upper leaf surface* green; prickles 0–8, straight, acicular, 2–4 mm long, prickles absent or present on midvein only or present on midvein and lateral veins; stellate hairs confined to midrib, or distributed throughout; protostellae absent; ordinary stellae very sparse to sparse, 0.6–3 mm apart, 0.2–0.5 mm across, sessile; lateral rays 7 or 8, porrect; central ray 3–6 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Lower leaf surface* white, yellowish or rusty; prickles absent; stellae moderate to very dense, 0.05–0.3 mm apart, 0.3–0.4 mm diameter, sessile; lateral rays 7 or 8, porrect; central ray 3–5 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Inflorescence* supra-axillary, solitary or pseudo-racemose, common peduncle 0–3 mm long, rachis prickles absent; 1–4-flowered, weakly andromonoecious, flowers 5-merous; pedicels 11–28 mm long at anthesis, same thickness throughout, 0.6–0.8 mm thick at mid-point, prickles absent or present. Calyx tube 1.5–2.5 mm long, lobes attenuate, 4–7 mm long; prickles absent at anthesis; stellae dense, transparent, 0.3–0.4 mm across, sessile, lateral rays 7 or 8, central ray 2–5 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. Corolla purple, 10–13 mm long, shallowly or deeply lobed, inner surface glabrous; anthers 3.5–5.5 mm long; ovary with stellate and Type 2 hairs; functional style 7.5–8 mm long, erect, with stellate hairs only, stellae 0.5–0.7 mm across, lateral rays 8–9, central ray 1–2 times as long as laterals. *Fruiting calyx* with lobes less than half length of mature fruit, prickles absent. Mature fruits 1 or 2 per inflorescence, globular, 14–16 mm diameter, yellowish-green or green, 1-locular (septum absent or incomplete); mesocarp moist but not juicy; exocarp 0.6–0.8 mm thick; pedicels 20–32 mm long in fruit, 0.6–0.8 mm thick at mid-point; seeds pale yellow, 3.5–4 mm long.

***Specimens examined*:** **Queensland.** MORETON DISTRICT: Tamborine Mtn, *anno* 1888, *Simmonds* 346 (BRI); Little Nerang River, Jan 1916, *White s.n.* (BRI); Lamington N.P., Nov 1942, *White* 11889 (BRI); Cainbable Ck track, Lamington N.P., *c.* 1 km SSE of Cainbable Falls, Nov 1995, *McDonald* 6176 (BRI); Nicholl's scrub, *c.* 6 km SW of Currumbin, Mar 2001, *Bean* 17398 (BRI); Darlington Range, Upper Ormeau, Feb 2002, *Bean* 18521 & *Leiper* (BRI); Rosins Lookout, Beechmont, Dec 2002, *Bean* 19681 (BRI). **New South Wales.** NORTH COAST: Three Mile scrub, near Byron Bay, Nov 1898, *Forsyth* (NSW); Byron Bay, Nov 1903, *Maiden* & *Boorman s.n.* (NSW); Levers Plateau on Qld–N.S.W. border, *c.* 90 km SSW of Brisbane, Apr 1972, *Henderson* H1299 (BRI); Brunswick Heads Nature Reserve, Oct 2000, *Bean* 16929 (BRI).

***Distribution and habitat*:** *Solanum serpens* is found from Mt Tamborine in Queensland to Byron Bay In N.S.W. (**Map 23**), although the Byron Bay population is probably extinct. It inhabits notophyll rainforest, especially where there are canopy gaps.

***Phenology*:** Flowers are recorded between October to April; fruits in March and April.

***Notes*:** *S. serpens* is rather variable in morphology, and intermediate forms with *S. acanthodapis* exist (Bean 2002b).

***Conservation status*:** It is known from several locations, some of which are on protected land. No conservation status is recommended at this time.

60. Solanum acanthodapis A.R.Bean, Austrobaileya 6: 250 (2002). **Type:** New South Wales. NORTH COAST: Big Scrub Flora Reserve, *c.* 20 km N of Lismore, 2 December 2000, *A.R. Bean* 17075 (holo: BRI; iso: AD, K, L, MEL, NSW).

***Illustration*:** Bean (2002b: 251)

Prostrate, stoloniferous perennial shrub, 0–0.3 m high. Juvenile stage absent. Adult branchlets terete or ridged, brown; prickles 25–65 per decimetre, straight, acicular, 3–7 mm long, 9–20 times longer than wide; stellae sparse to dense, 0.2–0.35 mm diameter, sessile; lateral rays 7 or 8, porrect; central ray 0.5–1.5 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Adult leaves* elliptical or ovate, entire or shallowly lobed throughout; lobes 2–4 on each side, acute, lobing index 1–1.4; lamina 5.5–9.5 cm long, 2.8–4.5 cm wide, 1.6–2.3 times longer than broad, apex acute, base cuneate or obtuse, oblique part 0–5 mm long, obliqueness index

0–5 percent; petioles 1–1.7 cm long, 14–29% length of lamina, prickles present. *Upper leaf surface* green; prickles 20–60, straight, acicular, 2–8 mm long, prickles present on midvein and lateral veins; stellate hairs confined to midrib; ordinary stellae absent from surface; finger hairs absent; Type 2 hairs absent. *Lower leaf surface* green to white or yellowish; prickles 10–30, straight, acicular, present on midvein and lateral veins; stellae sparse to very dense, 0.05–0.25 mm apart, 0.25–0.35 mm diameter, sessile; lateral rays 7 or 8, porrect; central ray 0.2–0.8 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Inflorescence* supra-axillary, pseudo-umbellate or pseudo-racemose, common peduncle 0–7 mm long, rachis prickles absent or present; 2–8-flowered, strongly or weakly andromonoecious, flowers 5-merous; pedicels 6–20 mm long at anthesis, same thickness throughout, 0.25–0.4 mm thick at mid-point, prickles absent or present. Calyx tube 2–3 mm long, lobes attenuate, 1.5–3.5 mm long; prickles absent or present at anthesis, 0–2 per flower, 0.5–1 mm long; stellae moderate, transparent or purple, 0.2–0.3 mm across, sessile, lateral rays 7 or 8, central ray 0.5–1 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. Corolla mauve or purple, 8–12 mm long, shallowly lobed, inner surface glabrous; anthers 4–5 mm long; ovary with Type 2 hairs only; functional style 6–7.5 mm long, erect, glabrous or with Type 2 hairs only. *Fruiting calyx* with lobes less than half length of mature fruit, prickles absent. Mature fruits 1 per inflorescence, globular, 15–18 mm diameter, yellowish-green, 1-locular (septum absent or incomplete); placenta in cross-section sessile, elliptical; mesocarp moist but not juicy; exocarp *c.* 0.8 mm thick; pedicels 21–30 mm long in fruit, *c.* 0.8 mm thick at mid-point; seeds pale yellow, 3.5–4 mm long.

***Specimens examined*: New South Wales.** North Coast: Victoria Park, 4 miles [6 km] SSW of Alstonville, Aug 1969, *Clark* 1260 *et al.* (BRI, NSW); Rotary Park, Lismore, Dec 2000, *Bean* 17081 (BRI); Booyong Flora Reserve, ENE of Lismore, Dec 2000, *Bean* 17083 (BRI); Victoria Park Nature Reserve, Apr 2001, *Bean* 17564 (AD, BRI, MEL, NSW).

***Distribution and habitat*:** *Solanum acanthodapis* is endemic to the extreme north-east of New South Wales, around Lismore (**Map 22**). It grows in canopy-gaps in notophyll rainforest.

***Phenology*:** Flowers recorded between August and February; fruits in March and April.

***Notes*:** Well-developed plants of this species form a dense prickly carpet, no more than 20 centimetres high. The fruits are borne virtually at ground level, and hidden from view by the foliage. I have not observed any clues that would indicate the method of seed dispersal.

***Conservation status*:** Applying the IUCN guidelines (IUCN. 2001), a category of "Vulnerable" is recommended (VU C2a(i)).

61. Solanum intonsum A.R.Bean **sp. nov.** Frutex perennis erectus; aculei ramulorum recti, ad basim lati, sparse distributi vel saepe absentes; folia adulta integra, lanceolata usque ovata; pagina superior folii protostellas gerens; stellae vulgatae sessiles, latitudine 0.15–0.25 mm, parcae usque densae; aculei calycis absentes; ovarium pilos type-2 tantum gerens; fructus 15–17 mm diametro, virides maturitate; pedicelli fructiferi 7–10 mm longi. **Typus:** Queensland. Cook District: Smiths track, Barron Gorge National Park, 6 May 2000, *A.R. Bean* 16542 (holo: BRI (1 sheet + spirit); iso: MEL, NSW).

Solanum sp. (Font Hills J.R. Clarkson+ 7901) in Henderson (2002).

Erect, rhizomatous perennial shrub, 0.8–2 m high. Juvenile branchlets with 30–50 prickles per dm, 1–7 mm long; leaves (in outline) ovate, entire or shallowly-lobed, with 2 or 3 pairs of lobes; lamina 9.5–14 cm long, 5.5–6 cm wide, with 0–7 prickles on upper surface. Adult branchlets yellow; prickles absent or present, 0–5 per decimetre, straight, broad-based, 0.5–6 mm long, 4–7 times longer than wide; stellae dense to very dense, 0.3–0.5 mm diameter, stalks 0–0.2 mm long; lateral rays 6–8, porrect; central ray 0.3–0.7 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Adult leaves* lanceolate or ovate, entire; lamina 4.5–16.5 cm long, 1.3–6.5 cm wide, 2.1–4.5 times longer than broad, apex acute, base cuneate or obtuse, oblique part 0–5 mm long, obliqueness index 0–6 percent; petioles 0.3–2.5 cm long, 7–30%

length of lamina, prickles absent. *Upper leaf surface* green or grey-green; prickles absent; stellate hairs distributed throughout; protostellae present; ordinary stellae density moderate to dense, 0.1–0.2 mm apart, 0.15–0.25 mm across, sessile; lateral rays 4–10, ascending; central ray 0.5–1 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Lower leaf surface* white; prickles absent; stellae dense to very dense, 0.05–0.1 mm apart, 0.4–0.6 mm diameter, stalks 0–0.2 mm long; lateral rays 7 or 8, porrect; central ray 0.2–0.6 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Inflorescence* supra-axillary, pseudo-umbellate or pseudo-racemose, common peduncle 0–5 mm long, rachis prickles absent; 2–7-flowered, weakly andromonoecious, flowers 5-merous; pedicels 4–9 mm long at anthesis, same thickness throughout, 0.5–0.8 mm thick at mid-point, prickles absent. Calyx tube 3–4.5 mm long, lobes attenuate, 1–5 mm long; prickles absent at anthesis; stellae dense to very dense, yellow, 0.25–0.4 mm across, stalks 0–0.1 mm long, lateral rays 7 or 8, central ray 0.5–1 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. Corolla purple, 9–13 mm long, shallowly lobed, inner surface sparsely stellate-hairy; anthers 4.5–5.5 mm long; ovary with Type 2 hairs only; functional style 8–9 mm long, erect, with stellate hairs only or with Type 2 hairs only, stellae *c.* 0.3 mm across, lateral rays 5–6, central ray 0.5–1 times as long as laterals. *Fruiting calyx* with lobes less than half length of mature fruit, prickles absent. Mature fruits 1 or 2 per inflorescence, globular, 15–17 mm diameter, green, 2-locular; placenta in cross-section sessile, linear; mesocarp moist but not juicy; exocarp *c.* 2 mm thick; pedicels 7–10 mm long in fruit, 0.8–1 mm thick at mid-point; seeds pale yellow, 2.3–2.8 mm long. **Fig. 35.**

***Specimens examined*: Queensland.** COOK DISTRICT: sources of Stuart's River [Stewart River near Coen], 1891, *Johnson s.n.* (MEL); Hartley's Creek, Cook Highway, Jul 1936, *Flecker* 1972, 1986 (BRI); Mt Carbine, Nov 1967, *Cassels* (BRI, QRS); S.F.700, Mar 1968, *Hyland* 4068 (BRI, QRS); Flinders Island, *c.* 7 km N of Bathurst Head, Jun 1978, *Clarkson* 2215 (BRI); Earl Hill near Cairns, Oct 1979, *Batianoff* 1292 & *McDonald* (AD, BRI); Richards Creek, Mount Mulligan, Apr 1984, *Clarkson* 5268 (AD, BRI, QRS); 'Font Hills', *c.* 15 km W of Mount Molloy, Apr 1989, *Clarkson* 7901 & *Henderson* (AD, BRI, DNA); Mt Alto, *c.* 4 km SSW of Mt Carbine, Apr 1989, *Clarkson* 7939 & *Henderson* (BRI); Cape Melville N.P., 2 km SSE of Temple Hill, May 1993, *Fell* DGF3172 & *Stanton* (BRI, CANB); S.F.144, Chowchilla L.A., Mar 1994, *Hyland* 15058 (QRS); Bakers Blue Mtn, Apr 1995, *Hyland* 15294 (QRS); Smiths Track, Barron Gorge N.P., Mar 1997, *Jago* 4284 (BRI).

***Distribution and habitat*:** *Solanum intonsum* is endemic to Queensland. Currently known to extend from Cape Melville to just south of Cairns, and west to Mt Mulligan (**Map 25**). There is also an historical record from the Stewart River near Coen. It grows on hilly to mountainous terrain, in shrubby eucalypt woodland or on the margins of rainforest or vine thicket.

***Phenology*:** Flowers are recorded from March to November; mature fruits in October and November.

***Notes*:** *S. intonsum* is related to *S. magnifolium*, but differs by the upper leaf surface with protostellae and moderate to dense ordinary stellae; the central ray of the stellate hairs much shorter on all plant parts; the longer hypanthium and attenuate calyx lobes; the smaller fruits, green at maturity and on shorter pedicels and the ovary with Type 2 hairs only.

***Conservation status*:** Moderately widespread. Not considered at risk.

***Etymology*:** From the Latin *in-* meaning not, and *tonsus* meaning shaven, referring to the dense but uniform indumentum of the leaves.

62. Solanum furfuraceum R.Br., Prodr. 446 (1810). **Type:** [Queensland. PORT CURTIS DISTRICT:] "Broadsound", September 1802, *R. Brown* (lecto: BM (Bennett No. 2672); isolecto: MEL [MEL11620]), fide Symon (1981).

Erect, rhizomatous perennial shrub, 1–3 m high. Juvenile branchlets with 60–90 prickles per dm; leaves (in outline) ovate, entire or shallowly-lobed, with 2 or 3 pairs of lobes; lamina 6–8 cm long, 2.5–4 cm wide, with 2–10 prickles on upper surface. Adult stems bark furrowed, corky. Adult branchlets brown; prickles absent or present, 0–15 per decimetre, straight, acicular, 4–10 mm long, 9–12 times longer than wide; stellae dense, 0.4–0.9 mm

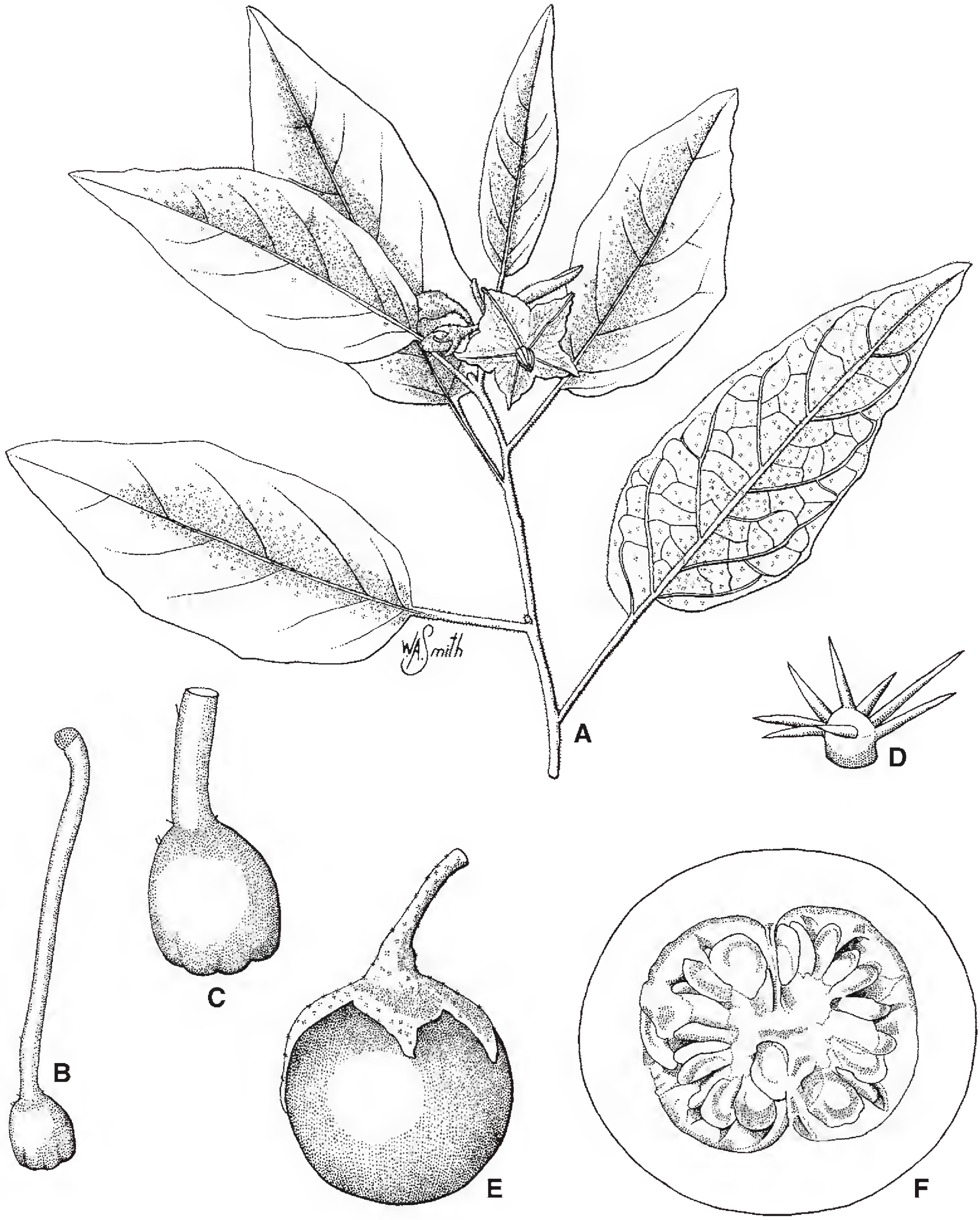


Fig. 35. ***Solanum intonsum***. A. flowering branchlet × 0.8. B. ovary and style × 6. C. ovary, bearing a few Type 2 hairs × 12. D. stellate hair, upper leaf surface × 100. E. mature fruit and calyx × 2. F. transverse section of fruit × 3. all from *Bean* 16542.

diameter, stalks 0.1–0.6 mm long; lateral rays 4–8, porrect; central ray 1–1.5 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Adult leaves* ovate, entire; lamina 3–11.5 cm long, 1.1–4.5 cm wide, 2.1–2.7 times longer than broad, apex acute, base cuneate or obtuse, oblique part 0–7 mm long, obliqueness index 0–7 percent; petioles 0.5–1.3 cm long, 8–18% length of lamina, prickles absent. *Upper leaf surface* green; prickles 0–2, straight, acicular, 5–7 mm long, prickles absent or present on midvein only; stellate hairs distributed throughout; protostellae present; ordinary stellae density sparse to moderate, 0.4–0.7 mm apart, 0.4–0.8 mm across, stalks 0–0.3 mm long; lateral rays 4–7, porrect to ascending; central ray 1–2 times as long as laterals, not gland-tipped; finger hairs present, 0.1–0.3 mm apart, not gland-tipped, 0.1–0.3 mm long; Type 2 hairs absent. *Lower leaf surface* yellowish or rusty; prickles absent; stellae dense, 0.1–0.3 mm apart, 0.6–1 mm diameter, stalks 0.1–0.7 mm long; lateral rays 4–8, porrect; central ray 1–2 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Inflorescence* leaf-opposed, pseudo-racemose, common peduncle 9–12 mm long, rachis prickles absent; 5–8-flowered, weakly andromonoecious, flowers 5-merous; pedicels 2–8 mm long at anthesis, same thickness throughout, 0.5–0.7 mm thick at mid-point, prickles absent. Calyx tube 1.5–3.5 mm long, lobes deltate or attenuate, 2–5 mm long; prickles absent at anthesis; stellae dense, transparent, 0.5–0.8 mm across, stalks 0–0.2 mm long, lateral rays 4–8, central ray 1–1.5 times as long as laterals, not gland-tipped or gland-tipped; finger hairs absent; Type 2 hairs present. Corolla mauve or purple, 9–17 mm long, shallowly lobed, inner surface glabrous or sparsely stellate-hairy; anthers 4.5–7 mm long; ovary glabrous; functional style 8.5–10 mm long, erect, glabrous or with stellate hairs only, stellae *c.* 0.4 mm across, lateral rays *c.* 4, central ray *c.* 2 times as long as laterals. *Fruiting calyx* with lobes less than half length of mature fruit, prickles absent. Mature fruits 1–3 per inflorescence, oblate or globular, 15–21 mm diameter, yellowish-green or green, 2-locular; placenta in cross-section stalked, anvil-shaped; mesocarp moist but not juicy; exocarp 2–2.6 mm thick; pedicels 4–8 mm long in fruit, 0.6–0.8 mm thick at mid-point; seeds pale yellow, 2.5–2.6 mm long. *Corky Nightshade.* **Fig. 5.**

Specimens examined**: Queensland.** NORTH KENNEDY DISTRICT: Wild Horse Mtn, W of Townsville, May 1996, *Cumming* 14644 (BRI). SOUTH KENNEDY DISTRICT: 'Havilah', Dec 1992, *Fensham* 965 (BRI). LEICHHARDT DISTRICT: Rosedale, near Baralaba, Sep 1959, *Johnson* 919 (BRI); Dipperu N.P., Sep 1971, *McDonald* 116 (BRI); Isla Gorge, *c.* 28 km SW of Theodore, Aug 1973, *Sharpe* 645 & Hockings (BRI); near Yatton Ck, *c.* 93 km from Marlborough, Sep 1973, *Moriarty* 1467 (BRI); 'Clifton', northern Boomer Range, Feb 1993, *Fensham* 717 (BRI); Auburn Range S.F., *c.* 50 km S of Thangool, Jun 1996, *Bean* 10339 (BRI, MEL, NSW). PORT CURTIS DISTRICT: Marmor, near Rockhampton, Mar 1920, *Francis s.n.* (BRI); Callide valley, Apr 1937, *White* 10773 (BRI); Ogmore, Sep 1943, *Blake* 15311 (BRI); Jim Crow Mtn, Rockhampton district, Apr 1963, *McKee* 10272 (BRI); Dan Dan Scrub, S.F.53, 20 km SW of Calliope, Nov 1987, *Gibson* 1116 (AD, BRI); *c.* 37 km WSW of Ridgelands, Fitzroy Shire, Apr 1990, *Anderson* 4846 (BRI); 15 km NE of Biloela, 3 km N of Callide Dam, Jul 1992, *Thompson* BIL24 (BRI); E boundary of Triangle Creek, Taunton N.P., Oct 1995, *Melzer* RM632 (BRI); S.F.114, 14 km from top ridge near Fairview HS, Dec 1998, *Batianoff* 98125 *et al.* (BRI); western edge of S.F.69, SE of Biloela, Dec 1999, *Bean* 15928 (BRI, MEL, MO). MARANOA DISTRICT: *c.* 20 miles [32 km] W of Mitchell, Mar 1950, *Everist s.n.* (BRI, CANB). BURNETT DISTRICT: Coalstoun crater, Nov 1970, *Bell* 263 (BRI); Mt Blandy, Burnett River, Dec 1981, *Forster* 1051 (BRI); *c.* 15 km NW of Abercorn, near S edge of Coominglah S.F., Jan 2003, *Bean* 19727 (BRI).

Distribution and habitat**:** *Solanum furfuraceum* is endemic to Queensland. In subcoastal areas extending from west of Townsville to the Gayndah area, and with a disjunct occurrence west of Mitchell (**Map 21**). Most records come from within 200 km of Rockhampton. It grows in vine thicket, communities dominated by brigalow (*Acacia harpophylla*) or bottle trees (*Brachychiton rupestris*), or in nearby shrubby eucalypt woodland. Soils are moderately to very fertile.

Phenology**:** Flowers are recorded for most months of the year; mature fruits from March–June and September–December.

Notes**:** *Solanum furfuraceum* and *S. sporadotrichum* are notable for their corky bark, very conspicuous on adult plants, but usually visible even on herbarium specimens. *S. furfuraceum* forms a handsome shrub with its yellowish bark and often abundant purple flowers.

Conservation status**:** Widespread. Not considered at risk.

63. Solanum sporadotrichum F.Muell., Chem. & Druggist (Melb. Chemist) Oct. 1882 p. 48 (1882). **Type:** Queensland. NORTH KENNEDY DISTRICT: Mount Dryander, undated, *Kilner & E. Fitzalan* (lecto: MEL [MEL12282]), *fide* Symon (1981).

Erect, rhizomatous perennial shrub, 1.5–4 m high. Juvenile branchlets with *c.* 130 prickles per dm, 1–5 mm long; leaves (in outline) broadly ovate, shallowly-lobed, with 3–5 pairs of lobes; lamina 6.5–8.5 cm long, 5–6 cm wide, with 80–120 prickles on upper surface. Bark on adult stems furrowed, corky. Adult branchlets brown; prickles absent or present, 0–3 per decimetre, straight, acicular, 4–7 mm long, 10–12 times longer than wide; stellae sparse, 0.3–0.6 mm diameter, sessile; lateral rays 5–8, porrect; central ray 0.3–0.7 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Adult leaves* ovate, shallowly lobed throughout; lobes 3 or 4 on each side, obtuse, lobing index 1.1–1.4; lamina 6.5–11 cm long, 3.5–5.5 cm wide, 1.6–2.1 times longer than broad, apex obtuse or acute, base obtuse, oblique part 0–6 mm long, obliqueness index 0–8 percent; petioles 1–2.2 cm long, 13–25% length of lamina, prickles absent. *Upper leaf surface* green; prickles 0–30, straight, acicular, 1–6 mm long, prickles absent or present on midvein only or present on midvein and lateral veins; stellate hairs distributed throughout; protostellae present; ordinary stellae sparse, 0.9–1.6 mm apart, 0.4–0.5 mm across, sessile; lateral rays 4–8, porrect; central ray 0.5–1 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Lower leaf surface* green; prickles 0–15, straight, acicular, absent or present on midvein only or present on midvein and lateral veins; stellae moderate to dense, 0.4–0.8 mm apart, 0.5–0.9 mm diameter, stalks 0–0.1 mm long; lateral rays 6–8, porrect; central ray 0.3–0.7 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Inflorescence* supra-axillary, pseudo-racemose, common peduncle 11–16 mm long, rachis prickles absent; 3–7-flowered, weakly andromonoecious, flowers 5-merous; pedicels 5–10 mm long at anthesis, same thickness throughout, 0.5–0.8 mm thick at mid-point, prickles absent. Calyx tube 2–3 mm long, lobes deltate or attenuate, 2.5–7.5 mm long; prickles absent at anthesis; stellae moderate to dense, transparent, 0.3–0.5 mm across, sessile, lateral rays 5–7, central ray 0.7–1.5 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. Corolla purple, 7–12 mm long, shallowly or deeply lobed, inner surface glabrous; anthers 4.5–7.5 mm long; ovary glabrous; functional style 10–11.5 mm long, erect, glabrous. *Fruiting calyx* with lobes less than or more than half length of mature fruit, prickles absent. Mature fruits 1 or 2 per inflorescence, globular, *c.* 13 mm diameter, green, 1-locular (septum absent or incomplete); placenta in cross-section sessile, semi-circular; mesocarp moist but not juicy; exocarp 2.3–2.5 mm thick; pedicels 6–13 mm long in fruit, 0.5–0.8 mm thick at mid-point; seeds pale yellow, *c.* 2.9 mm long.

***Specimens examined*:** **Queensland.** NORTH KENNEDY DISTRICT: near crest of ridge leading to easterly peak of Mt Dryander, Jul 1974, *Henderson* H2213 *et al.* (BRI); Magnetic Island, near top of Mt Cook, Aug 1982, *Sandercoe* 904 (BRI); Mingela Bluff, Aug 1989, *Cumming* 9300 (BRI); ‘Fanning River’, 25 km NW of Mingela, Sep 1989, *Fell* 64 & *Cumming* (BRI); Mount Wickham, Jul 1993, *Fensham* 991 (BRI); Leichhardt Range, Jul 1993, *Fensham* 992 (BRI); Squally Bay, Gloucester Island, Apr 1994, *Batianoff* 940478 & *Figg* (BRI); East Coast bay, S of Mt Sunter, Conway N.P., May 1994, *Batianoff* 940579 & *Dillewaard* (BRI); Flame Tree Hill, *c.* 3 km ESE of Airlie Beach, Jun 1994, *McDonald* 5874 & *Champion* (BRI); headland W of Horseshoe Bay, Magnetic Island, Jan 1998, *Cumming* 16758 (BRI). SOUTH KENNEDY DISTRICT: Calder Island, May 1992, *Halford* Q1321 & *Crombie* (AD, BRI); Calder Island, *c.* 50 km NE of Mackay, Jun 2000, *Bean* 16693 & *Champion* (BRI, DNA, MEL, NSW).

***Distribution and habitat*:** *Solanum sporadotrichum* is endemic to Queensland ranging from west of Townsville to Airlie Beach, and on Calder Island (**Map 20**). It grows in semi-evergreen vine thicket, margins of littoral notophyll rainforest and (at Airlie Beach and Mt Dryander) in well-developed *Argyrodendron*-dominated rainforest.

***Phenology*:** Flowers are recorded for January, May, June, July and September; mature fruits in May, June and August.

***Notes*:** Closely related to *S. furfuraceum* (both have conspicuously corky bark), but differing by the lobed or angled leaves, the very sparse to sparse stellate indumentum and absence of finger hairs on the upper leaf surface, and the (usually) prickly adult leaves.

Conservation status**:** *S. sporadotrichum* is listed as "Rare" under the Queensland Nature Conservation Act, 1992. The species is more widespread than was known in 1992, and I do not consider it to be currently at risk.

64. Solanum francisii A.R.Bean **sp. nov.** Frutex perennis altus foliis atrovirentibus non profunde lobatis; ramuli porcati, aculeis numerosis et stellis 0.15–0.25 mm diametro; pagina superior folii aculeis 50–90 praedita; pedicelli floriferi 7–13 mm longi sub anthesi; aculei calycis 4–11 vel interdum absentes; pagina interna corollae sparse stellato-pilosa; fructus maturi virides, globulares, 14–22 mm diametro. **Typus:** Queensland. South Kennedy District: Eungella, 2 September 1938, *C.T. White* 12972 (holo: BRI; iso: CANB, MEL, *distribuendi*).

Erect, rhizomatous perennial shrub, 2.5–4 m high. Juvenile stage unknown. Adult branchlets ridged, brown; prickles 10–140 per decimetre, straight, acicular or broad-based, 4–10 mm long, 5–11 times longer than wide; stellae sparse, 0.15–0.25 mm diameter, sessile; lateral rays 5–7, porrect; central ray absent or present, 0–0.5 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Adult leaves* ovate, shallowly lobed throughout; lobes 3–5 on each side, acute, lobing index 1.1–1.4; lamina 13–21 cm long, 6.5–10 cm wide, 1.9–2.4 times longer than broad, apex acute, base obtuse or cordate, oblique part 2–6 mm long, obliqueness index 1–3 percent; petioles 1.6–3.5 cm long, 11–18% length of lamina, prickles absent or present. *Upper leaf surface* green; prickles 50–90, straight, acicular, 4–8 mm long, prickles present on midvein and lateral veins; stellate hairs distributed throughout; protostellae absent; ordinary stellae very sparse to sparse, 0.4–3 mm apart, 0.2–0.3 mm across, sessile; lateral rays 7–9, porrect; central ray 0.2–0.7 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Lower leaf surface* green; prickles 5–20, straight, acicular, present on midvein and lateral veins; stellae moderate, 0.3–0.8 mm apart, 0.2–0.3 mm diameter, sessile; lateral rays 7–9, porrect; central ray 0–0.5 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Inflorescence* supra-axillary, pseudo-racemose, common peduncle 1–22 mm long, rachis prickles absent; 9–14-flowered, with all flowers bisexual and 5(6)-merous; pedicels 7–13 mm long at anthesis, same thickness throughout, 0.5–0.7 mm thick at mid-point, prickles absent or present. Calyx tube 3.5–4.5 mm long, lobes attenuate, 1.5–7 mm long; prickles absent or present at anthesis, 0–11 per flower, 3–6 mm long; stellae sparse to moderate, transparent, 0.2–0.3 mm across, sessile, lateral rays 7 or 8, central ray 0.3–1 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs present. Corolla white or mauve, 12–17 mm long, shallowly or deeply lobed, inner surface sparsely stellate-hairy; anthers *c.* 5.8 mm long; ovary with Type 2 hairs only; functional style *c.* 10 mm long, erect, with Type 2 hairs only. *Fruiting calyx* with lobes less than half length of mature fruit, prickles 4–8 mm long. Mature fruits 1–8 per inflorescence, globular, 14–22 mm diameter, yellowish-green or green, 2-locular; placenta in cross-section stalked, anvil-shaped; mesocarp moist but not juicy; exocarp 1–1.4 mm thick; pedicels 16–23 mm long in fruit, 0.9–1.2 mm thick at mid-point; seeds white or pale yellow, 2–2.3 mm long. **Fig. 36.**

Specimens examined**: Queensland.** South Kennedy District: Eungella Range, via Mackay, Oct 1922, *Francis s.n.* (BRI); catchment of Mt William Creek, Eungella N.P., Dec 2002, *Meyer & Bloor s.n.* (BRI); Snake Road, S.F.62, NE of Eungella township, Feb 2003, *Bean* 20031 (BRI, MEL); Chelman's Road, S.F.62, NE of Eungella, Feb 2003, *Bean* 20057 (BRI).

Distribution and habitat**:** *Solanum francisii* is endemic to Queensland. Recorded only from the Eungella area, west of Mackay (**Map 12**). It grows in high-rainfall notophyll rainforest at altitudes of 1000–1100 metres.

Phenology**:** Flowers recorded for September and October; mature fruits in February.

Notes**:** *S. francisii* is related to *S. sporadotrichum*, but differs by: the bark non-corky, except at the base of large plants; the longer and wider leaves with acute lobes; smaller stellae on all plant parts; inner surface of corolla sparsely stellate-hairy; calyx prickles usually present; and calyx with Type 2 hairs.

Conservation status**:** *S. francisii* is known only from a small section of the Eungella N.P. and an adjacent State Forest. It is threatened by low

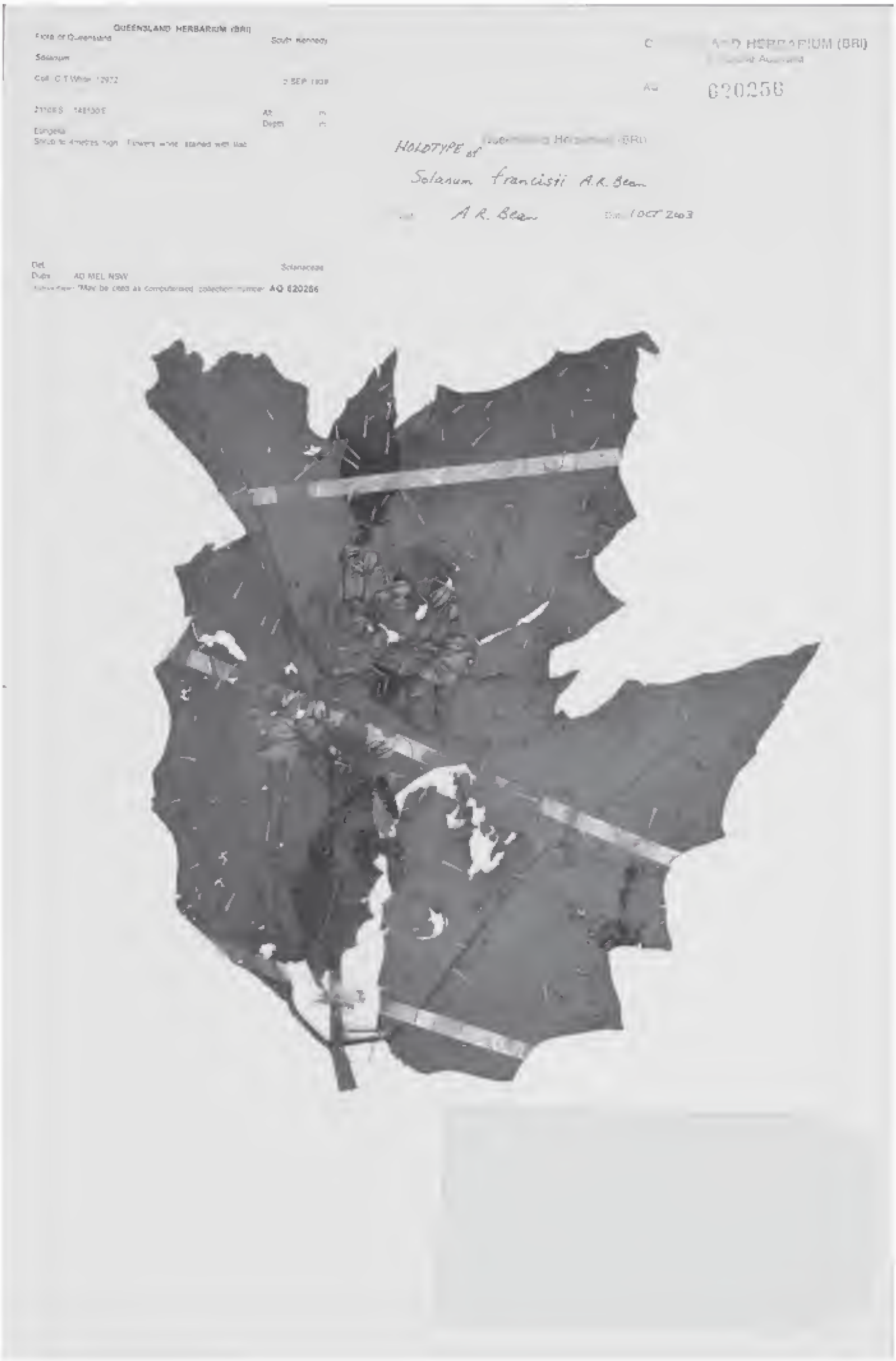

QUEENSLAND HERBARIUM (BRI)
Solanum
Solanaceae
AD MEL NSW
AQ 620256
HERBARIUM (BRI)
620256
HOLOTYPE of
Solanum francisii A.R. Bean
A.R. Bean
1 OCT 2003

Fig. 36. Holotype of ***Solanum francisii***.

population size and weeds (especially *Lantana camara*). Applying the IUCN guidelines (IUCN. 2001), a category of "Vulnerable" is recommended (VU B1ab(iii,v)+2ab(iii,v); C1+2a(i); D1).

Etymology: Named for W.D. Francis (1889–1959), the first collector of the species. Mr Francis was the author of the well known book "Rainforest Trees of Australia", and was for a time the Director of the Queensland Herbarium.

65. Solanum dumicola A.R.Bean **sp. nov.** Fruticulus; cortice tenui, nondescripto; ramulorum aculei 30–70 per decimetrum; folia adulta integra, ovata usque late ovata; pagina superior folii viridis, stellis sparsis praedita, pilis digitatis carens; inflorescentiae 1–3-florae; pagina interna corollae sparse stellato-pilosa; calyx stellis 0.25–0.4 mm latitudine ornatus, pilis type-2 gerens sed aculeis carens; fructus maturi virides, pedicellis 10–24 mm longis. **Typus:** Queensland. Leichhardt District: Cannondale scrub, Amphitheatre section, Expedition National Park, 6 November 1998, *P.I. Forster* PIF23858 & *R. Booth* (holo: BRI (1 sheet + spirit); iso: MEL, QRS).

Sprawling or erect, herbaceous resprouter, 0.3–0.5 m high. Juvenile stage unknown. Adult branchlets brown or green; prickles 30–70 per decimetre, straight, acicular, 6–10 mm long, 13–20 times longer than wide; stellae dense, 0.25–0.6 mm diameter, stalks 0–0.2 mm long; lateral rays 4–7, porrect; central ray 1–1.5 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Adult leaves* ovate or broadly ovate, entire; lamina 4.5–12.5 cm long, 3–7.5 cm wide, 1.6–1.9 times longer than broad, apex obtuse or acute, base cuneate, oblique part 0–7 mm long, obliqueness index 0–7 percent; petioles 0.6–2.8 cm long, 13–25% length of lamina, prickles present. *Upper leaf surface* green; prickles 0–20, straight, acicular, 3–7 mm long, prickles absent or present on midvein only or present on midvein and lateral veins; stellate hairs distributed throughout; protostellae absent; ordinary stellae sparse, 0.4–1.7 mm apart, 0.3–0.7 mm across, stalks 0–0.15 mm long; lateral rays 5–8, porrect; central ray 1–2 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Lower leaf surface* greenish-white; prickles 0 or 1, straight, acicular, absent or present on midvein only; stellae dense, 0.15–0.4 mm apart, 0.6–0.8 mm diameter, stalks 0–0.2 mm long; lateral rays 5–8, porrect; central ray 1–1.5 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Inflorescence* supra-axillary, solitary or pseudo-racemose, common peduncle 1.5–4 mm long, rachis prickles present; 1–3-flowered, strongly andromonoecious, flowers 5-merous; pedicels 8–13 mm long at anthesis, same thickness throughout, 0.9–1.1 mm thick at mid-point, prickles absent or present. Calyx tube 3–5 mm long, lobes attenuate, 4–6 mm long; prickles absent at anthesis; stellae dense, white, 0.25–0.4 mm across, sessile, lateral rays 5–8, central ray 1–1.5 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs present. Corolla mauve, 7–11 mm long, shallowly lobed, inner surface sparsely stellate-hairy; anthers 4–5 mm long; ovary with stellate and Type 2 hairs; functional style 5–6 mm long, erect, with stellate and Type 2 hairs, stellae *c.* 0.25 mm across, lateral rays 6–8, central ray 1–1.5 times as long as laterals. *Fruiting calyx* with lobes less than half length of mature fruit, prickles absent. Mature fruits 1 or 2 per inflorescence, globular, 16–19 mm diameter, green; mesocarp moist but not juicy; exocarp 0.8–1 mm thick; pedicels 10–24 mm long in fruit, 1.1–2 mm thick at mid-point; seeds pale yellow, 2–2.3 mm long. **Fig. 37.**

Specimens examined: **Queensland.** Leichhardt District: Injune–Rolleston road, *c.* 77 km from Injune, Sep 1974, *Moriarty* 1556 (BRI, CANB). Warrego District: above Cattle Creek, 'Carnarvon' station, NW of Injune, Jun 1999, *McDonald* 6768 (BRI); 'Carnarvon' station, Mar 2001, *Fensham* 4249 (BRI). Maranoa District: The Tombs, Maranoa River W branch, *c.* 110 km NW of Injune, Jun 1977, *Crisp* 3113A (BRI).

Distribution and habitat: *Solanum dumicola* is endemic to Queensland. Known from a few scattered locations in south central Queensland (**Map 23**). It usually grows in semi-evergreen vine thicket or Belah (*Casuarina cristata*) forest on clayey soil, but there is one record from ironbark woodland on sandy soil.

Phenology: Poorly known. Flowers are recorded for June and November; mature fruits for March and November.

Notes: *S. dumicola* is related to *S. furfuraceum*, but differs by its small size; the thin non-

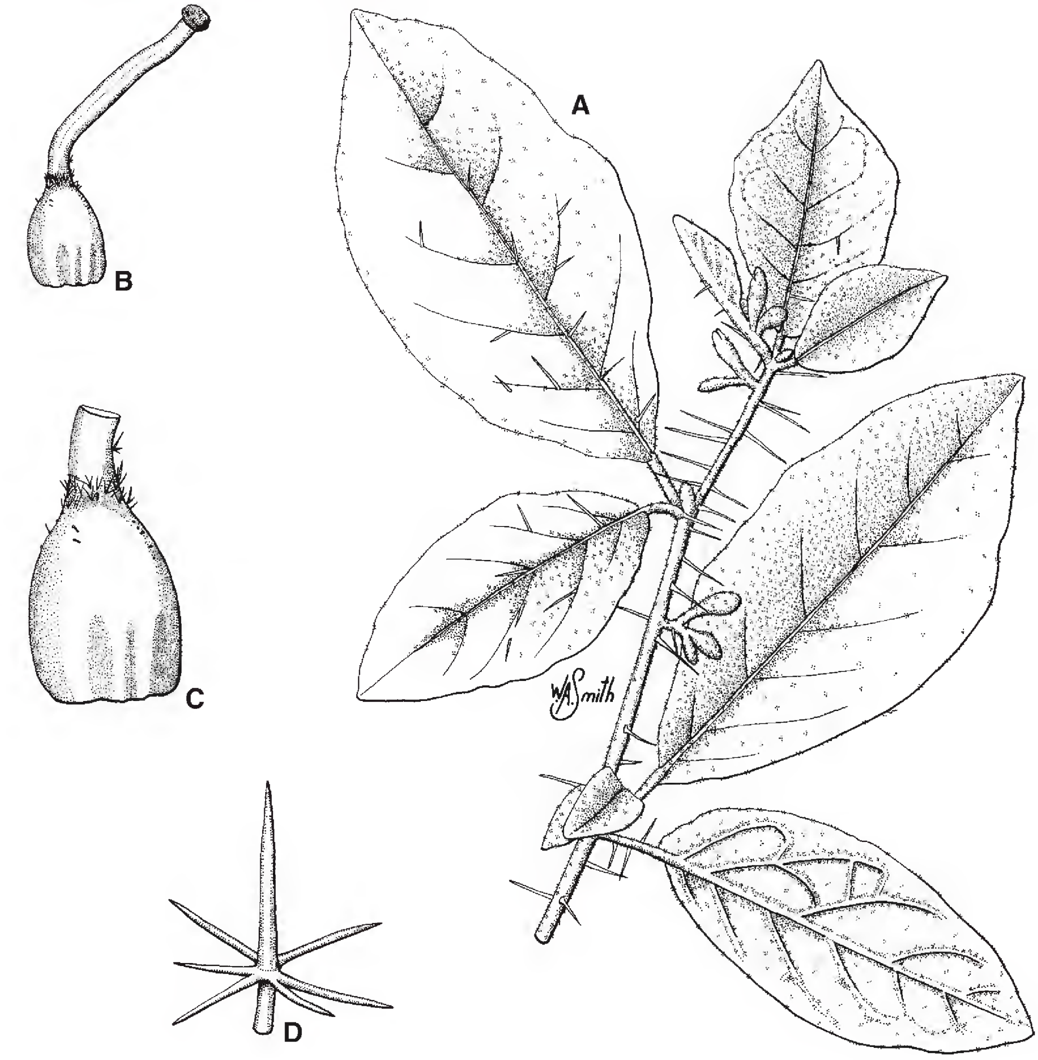


Fig. 37. ***Solanum dumicola*.** A. flowering branchlet × 1. B. ovary and style × 6. C. ovary with stellate and Type 2 hairs × 12. D. stellate hair, upper leaf surface × 60. A, D, *Moriarty* 1556; B–C, *Forster* 23858.

descript bark, the more frequent prickles on the branchlets; the broader adult leaves; the sparse stellate indumentum and absence of finger hairs on the upper leaf surface; the reduced 1–3 flowered inflorescence; the smaller stellae on the calyx; and the longer fruiting pedicels.

***Conservation status*:** *S. dumicola* has been recorded from 4 locations, and is currently known from 2 locations. It is threatened by clearing of regrowth forest. Applying the IUCN guidelines (IUCN. 2001), a category of “Vulnerable” is recommended (VU B2ab(iii)). One population is within the Expedition National Park.

***Etymology*:** The epithet is from the Latin, and means “dweller in thickets”, a reference to the usual habitat.

66. Solanum tetrathecum F.Muell., Fragm. 2: 165 (1861). **Type:** [Queensland.] “Eutassa Ranges, Upper Brisbane” [River], December 1856, *F. Mueller* (lecto: MEL [MEL12231]), *fide* Symon (1981).

Erect, herbaceous resprouter, 0.2–0.5 m high. Juvenile stage absent. Adult branchlets grey or yellow; prickles 1–20 per decimetre, straight, acicular, 3–10 mm long, 6–15 times longer than wide; stellae very dense, 0.4–0.6 mm diameter, stalks 0–0.1 mm long; lateral rays 6–9, porrect; central ray absent or present, 0–1 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Adult leaves* elliptical or ovate, entire; lamina 3–7 cm long, 1.1–3.2 cm wide, 2.2–3.2 times longer than broad, apex obtuse, base cuneate or obtuse, oblique part 0–3 mm long, obliqueness index 0–4 percent; petioles 0.4–2.2 cm long, 11–30% length of lamina, prickles absent. *Upper leaf surface* green; prickles 0–3, straight, acicular, 5–11 mm long, prickles absent or present on midvein only; stellate hairs confined to midrib, or distributed throughout; protostellae absent; ordinary stellae density very sparse to moderate, 0.4–1.6 mm apart, 0.25–0.5 mm across, sessile; lateral rays 7 or 8, porrect; central ray 0.6–1.2 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent or present throughout, 0.1–0.5 mm apart. *Lower leaf surface* white or yellowish; prickles absent; stellae dense, *c.* 0.1 mm apart, 0.4–0.7 mm diameter, stalks 0–0.1 mm long; lateral rays 7–9, porrect; central ray 0.7–1.2 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Inflorescence* leaf-opposed or supra-axillary, solitary or pseudo-racemose, common peduncle 3–11 mm long, rachis prickles absent; 1–3-flowered, weakly andromonoecious, flowers 5-merous; pedicels 5–20 mm long at anthesis, same thickness throughout, 0.8–1.3 mm thick at mid-point, prickles absent. Calyx tube 3–4.5 mm long, lobes deltate, 1–3.5 mm long; prickles absent at anthesis; stellae very dense, yellow, 0.25–0.4 mm across, stalks 0–0.1 mm long, lateral rays 7–10, central ray 0.7–1.3 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. Corolla mauve or purple, 8–15 mm long, deeply lobed, inner surface sparsely to densely stellate-hairy; anthers 5–7 mm long; ovary with Type 2 hairs only; functional style 8.5–12.5 mm long, erect, with stellate and Type 2 hairs, stellae 0.1–0.2 mm across, lateral rays *c.* 6, central ray *c.* 1 times as long as laterals. *Fruiting calyx* with lobes less than or more than half length of mature fruit, prickles absent. Mature fruits 1 per inflorescence, globular, 12–17 mm diameter, yellowish-green or pale green with dark green streaks, 4-locular; placenta in cross-section sessile, semi-circular, or stalked, anvil-shaped; mesocarp moist but not juicy; exocarp 0.6–1.1 mm thick; pedicels 8–20 mm long in fruit, 0.8–1.3 mm thick at mid-point; seeds pale yellow, brown or black, 2.7–2.8 mm long.

***Specimens examined*: Queensland.** Burnett District: Kingaroy, Oct 1945, *Michael* 2955 (BRI); 'Kragra', 60 km N of Chinchilla, Aug 1986, *Hando* (BRI); Meandu Mine, Tarong Coal, adjacent to Dobby L.A., S.F.289, Feb 1994, *Forster* PIF14837 & *Smyrell* (AD, BRI); S.F.132 Allies Creek, *c.* 55 km S of Mundubbera, Nov 2002, *Bean* 19609 (BRI, NSW). Darling Downs District: Tara, Feb 1938, *White* 11181 (BRI); 'Parkhurst' via St George, Mar 1955, *Taylor* (BRI); 'Woodlands', 38 miles [61 km] N of Bungunya, Jun 1960, *Johnson* 1602 (BRI); 10 miles [16 km] N of Chinchilla, May 1966, *Redgen* 39 (AD, CANB); 'Dilbong', 35 miles [56 km] WSW of Tara, May 1968, *Clague* (BRI); Bullock Head road, 21 km S of Hannaford, Nov 1974, *Johnson* 2999 (BRI); 20.5 km SE of Moonie Hwy, SE of Westmar, Nov 1999, *Bean* 15861 (BRI); 'Karriba', SW of Milmerran, Nov 1999, *Bean* 15889 (BRI); cnr Schwennsen's Road & Riverglen road, N of Glenmorgan, Apr 2001, *Bean* 17665 & *Pedley* (BRI); off Lee's Road, 17 km W of Chinchilla, Feb 2003, *Bean* 19964 (BRI). Moreton District: Cooyar Range, S.F.289, *c.* 6 miles [10 km] W of Yarraman, Jul 1969, *Smith* 14736 (BRI, CANB); S.F.289, *c.* 5 km NW of Yarraman, Jan 2000, *Bean* 15991 (BRI, CANB, MEL, NSW).

***Distribution and habitat*:** *Solanum tetrathecum* is endemic to Queensland. Known from two separate areas: the main area is on the western Darling Downs from Allies Creek to Westmar; the other is around Kingaroy and Yarraman (**Map 22**). It usually inhabits heavy clays soils in Brigalow-Belah forest, but also grows on the margins of notophyll rainforest, in *Eucalyptus populnea* woodland or (rarely) on stony ironbark ridges.

***Phenology*:** Flowers are recorded for all months of the year; mature fruits from November to June.

***Notes*:** Closely related to *S. jucundum*. See notes under that species.

***Conservation status*:** Widespread. Not considered at risk.

67. Solanum cocosoides A.R.Bean **sp. nov.**

Frutex sparse aculeatus usque ad 1.5 m alto; folia adulta integra ovata sine aculeis; indumento stellato in paginis ambabus densissime praedita; stellae

> ramulorum calycumque pedicellis usque ad 2 mm longae; florae pedicellis 1–4 mm longae sub anthesi; corollae facies interna dense stellato-pilosa; aculei calycis absentes; fructus maturi 4-loculares, virides usque flaveoli; semina brunnea usque atra. **Typus:** Queensland. LEICHHARDT DISTRICT: 21.1 km W of Blackwater, 16 September 1999, *A.R. Bean* 15403 (holo: BRI (1 sheet + spirit); iso: CANB, MEL, NSW, NY).

Erect, rhizomatous perennial shrub, 1–1.5 m high. Juvenile stage unknown. Adult branchlets terete or ridged, rusty or brown; prickles absent or present, 0–5 per decimetre, straight, broad-based, 4–10 mm long, 4–7 times longer than wide; stellae very dense, 0.5–1 mm diameter, stalks 0.2–2.2 mm long; lateral rays 7–11, ascending; central ray 1–2 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Adult leaves* ovate, entire; lamina 4.5–8.5 cm long, 1.7–3.5 cm wide, 2.3–2.7 times longer than broad, apex acute, base obtuse or cordate, oblique part 0–3 mm long, obliqueness index 0–6 percent; petioles 0.9–2.5 cm long, 17–35% length of lamina, prickles absent. *Upper leaf surface* grey; prickles absent; stellate hairs distributed throughout; protostellae absent; ordinary stellae very dense, *c.* 0.05 mm apart, 0.4–0.8 mm across, stalks 0–0.1 mm long; lateral rays 7 or 8, porrect or ascending; central ray 1–1.5 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Lower leaf surface* white or yellowish; prickles absent; stellae very dense, *c.* 0.05 mm apart, 0.5–0.8 mm diameter, stalks 0–0.3 mm long; lateral rays 7–9, porrect; central ray 1–1.5 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Inflorescence* supra-axillary, pseudo-racemose, common peduncle 15–33 mm long, rachis prickles absent; 2–5-flowered, weakly andromonoecious, flowers 5-merous; pedicels 1–4 mm long at anthesis, same thickness throughout or markedly thicker distally, *c.* 0.7 mm thick at mid-point, prickles absent. Calyx tube 3–4 mm long, lobes attenuate, 3–9 mm long; prickles absent at anthesis; stellae very dense, brown or rusty, 0.4–1 mm across, stalks 0–2 mm long, lateral rays 7 or 8, central ray 1–2 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. Corolla purple, 12–20 mm long, rotate, inner surface densely stellate-hairy; anthers 5.5–6.5 mm long; ovary with Type 2 hairs only; functional style 9.5–11.5 mm long, erect, with Type 2 hairs only. *Fruiting calyx* with lobes less than half length of mature fruit, prickles absent. Mature fruits 1–3 per inflorescence, globular, 14–20 mm diameter, yellowish-green or pale green with dark green streaks, 4-locular; placenta in cross-section stalked, circular to elliptical, or stalked, anvil-shaped; mesocarp moist but not juicy; exocarp 0.7–2.5 mm thick; pedicels 4–8 mm long in fruit, 1–1.2 mm thick at mid-point; seeds brown to black, 2.6–3 mm long. **Fig. 38.**

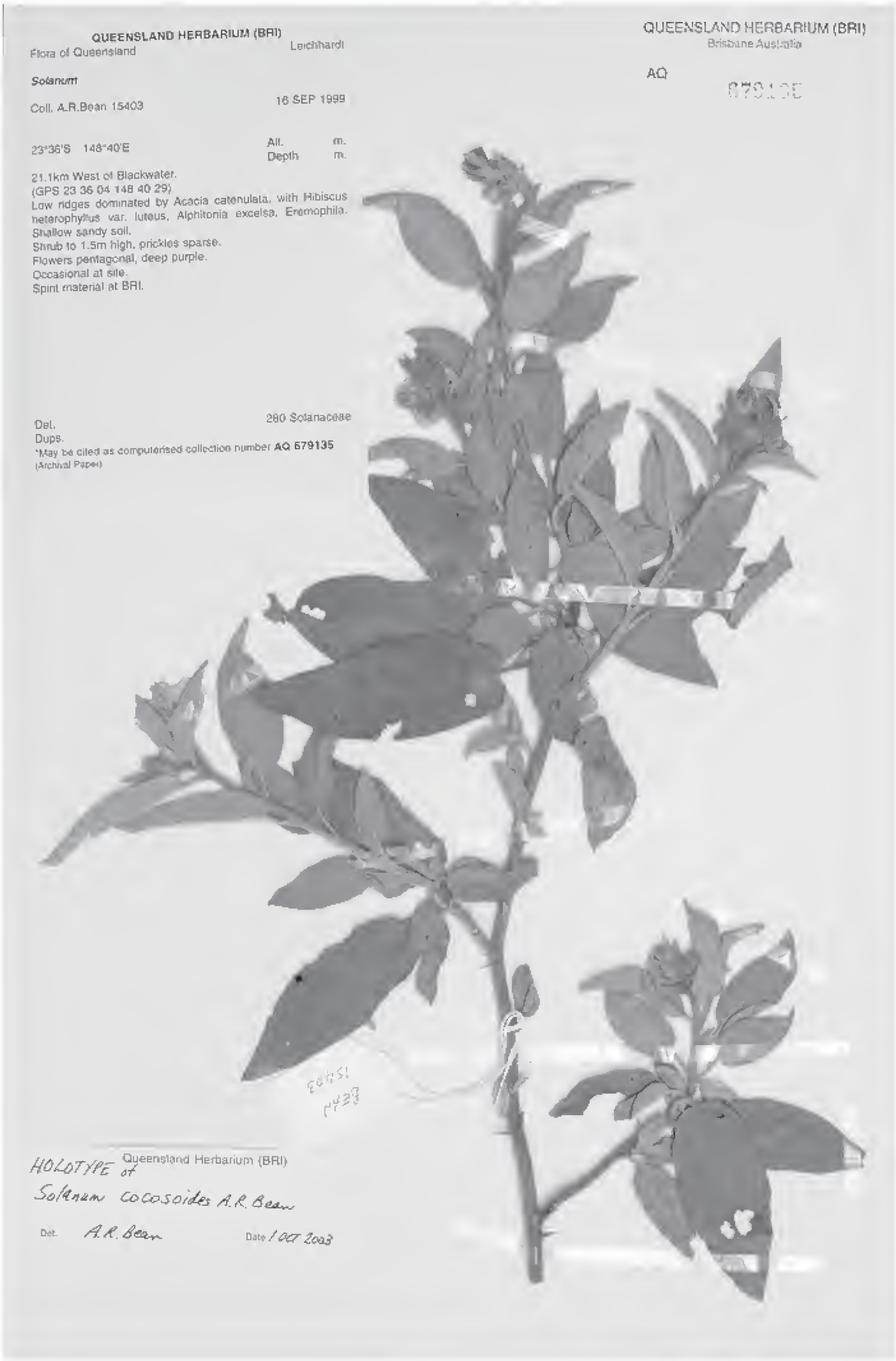
Specimens examined: **Queensland.** LEICHHARDT DISTRICT: 'Berrigurra', *c.* 17 km NW of Blackwater, Aug 1984, *Anderson* 3796 (BRI); 21.1 km W of Blackwater, Sep 1999, *Bean* 15401 (BRI, MEL); eastern edge of S.F.236, SW of Blackwater, Nov 2002, *Bean* 19522 (A, BRI, MEL, MO); 20.8 km W of Blackwater, Aug 1973, *Trapnell* 61 & *Williams* (BRI). MARANOA DISTRICT: Great Dividing Range, *c.* 80 km SW of Rolleston, 7 km SE of Mt Sugarloaf, Jun 1977, *Crisp* 3102 (AD, BRI, CANB).

***Distribution and habitat*:** *Solanum cocosoides* is endemic to Queensland. Known from a limited area of central Queensland, around Blackwater and near Rolleston (**Map 24**). It inhabits low ridges dominated by *Acacia catenulata* (Bendee) and *Eucalyptus exserta*, with grey loamy soil.

***Phenology*:** Flowers are recorded from June to November; fruits are recorded for August and November.

***Notes*:** *S. cocosoides* is morphologically close to *S. jucundum*, but differs by the branchlet stellae 0.5–1 mm across, with stalks 0.2–2.2 mm long (0.15–0.4 mm across and stalks 0–0.4 mm long for *S. jucundum*); petioles 17–35% length of lamina (10–20% for *S. jucundum*); corolla rotate (deeply lobed for *S. jucundum*); the larger stellae on both leaf surfaces; and the often larger fruits.

***Conservation status*:** *S. cocosoides* has been collected from 4 locations in central Queensland. It is not known from a conservation reserve. Land clearance is a minor threat. Applying the IUCN guidelines (IUCN. 2001), a category of "Near Threatened" is recommended.



QUEENSLAND HERBARIUM (BRI)
Flora of Queensland Leichhardt

Solanum

Coll. A.R.Bean 15403 16 SEP 1999

23°36'S 148°40'E Alt. m.
Depth m.

21.1km West of Blackwater.
(GPS 23 36 04 148 40 29)
Low ridges dominated by Acacia catenulata, with Hibiscus heterophyllus var. luteus, Alphitonia excelsa, Eremophila.
Shallow sandy soil.
Shrub to 1.5m high, prickles sparse.
Flowers pentagonal, deep purple.
Occasional at site.
Spirit material at BRI.

Det. 280 Solanaceae
Dups.
*May be cited as computerised collection number **AQ 679135**
(Archival Paper)

QUEENSLAND HERBARIUM (BRI)
Brisbane Australia
AQ 679135

HOLOTYPE of
Queensland Herbarium (BRI)
Solanum cocosoides A.R. Bean
Det. A.R. Bean Date 1 OCT 2003

Fig. 38. Holotype of ***Solanum cocosoides***.

Etymology: resembling *Cocos*, a genus of palms; an allusion to the very long-stalked stellae of the branchlets, which resemble miniature palm-trees.

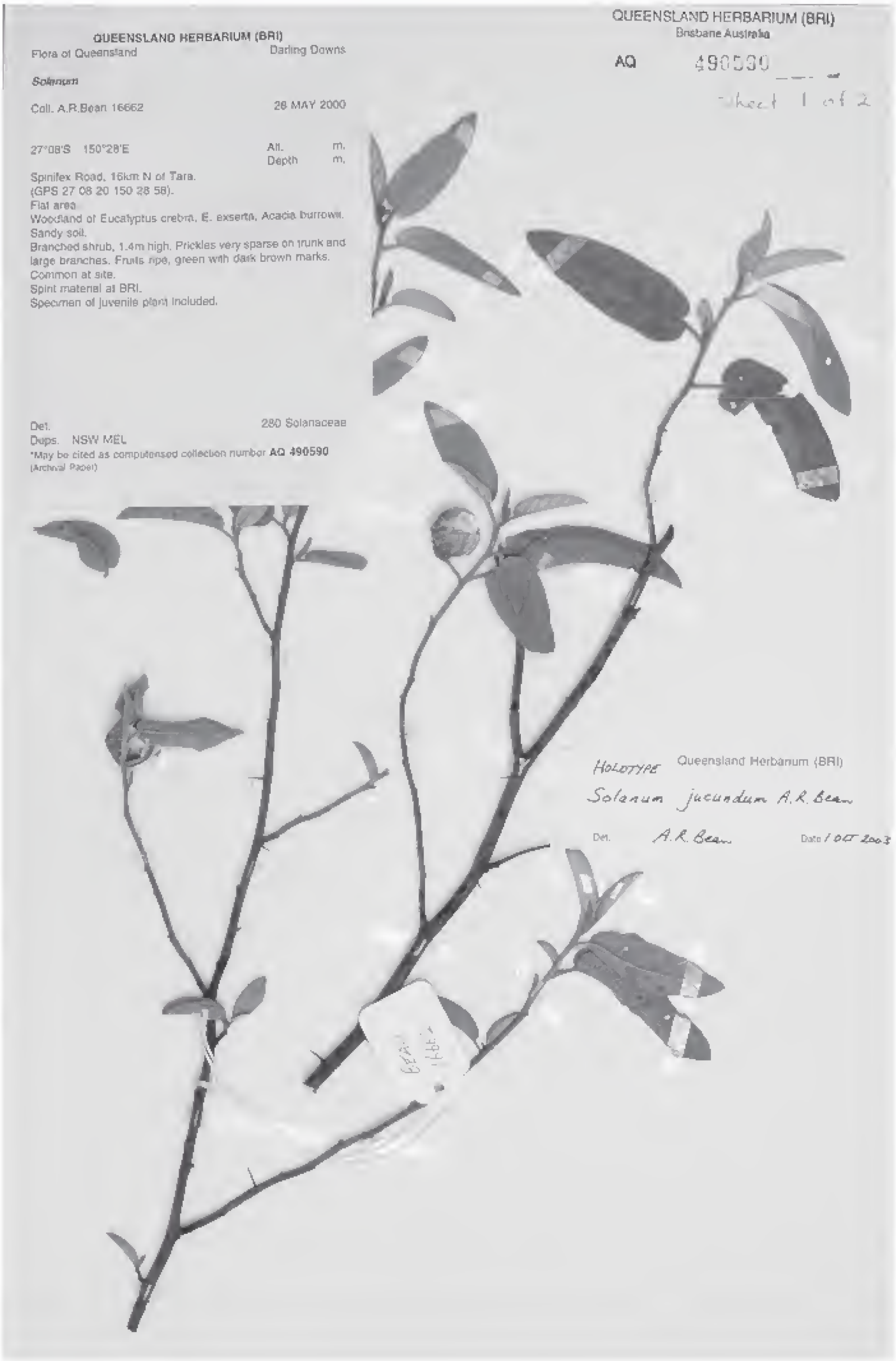
68. Solanum jucundum A.R.Bean **sp. nov.** Frutex perennis usque ad 1.8 m altus; aculei ramuli sparsi vel nulli; cortex tenuis non-descriptus; folia adulta integra, lanceolata usque ovata, aculeis carentia; pagina superior folii stellis densis usque densissimis et pilis type-2 praesentes; corolla profunde lobata, pagina interna dense stellato-pilosa; calyx aculeis carens, lobis rostratis usque attenuatis; fructus maturi globulares, 14–16 mm diametro, flavo usque viridi. **Typus:** Queensland. Darling Downs District: Spinifex Road, 16 km N of Tara, 28 May 2000, *A.R. Bean* 16662 (holo: BRI (2 sheets + spirit); iso: MEL, NSW).

Solanum sp. (Monto A.R. Bean 8817) in Henderson (2002).

Illustration: Symon (1981: 177), as *S. tetrathecum.*

Erect, rhizomatous perennial shrub, 0.7–1.8 m high. Juvenile stage unknown. Adult branchlets grey to yellow or rusty; prickles absent or present, 0–10 per decimetre, straight, acicular or broad-based, 6–10 mm long, 6–14 times longer than wide; stellae very dense, 0.15–0.4 mm diameter, stalks 0–0.4 mm long; lateral rays 8–11, porrect, ascending or multiradiate; central ray 1–1.5 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Adult leaves* lanceolate or ovate, entire; lamina 2.5–8.5 cm long, 1.1–2.3 cm wide, 2.3–3.6 times longer than broad, apex acute, base obtuse or cordate, oblique part 0–3.5 mm long, obliqueness index 0–4 percent; petioles 0.4–1.3 cm long, 10–20% length of lamina, prickles absent. *Upper leaf surface* grey-green or grey; prickles absent; stellate hairs distributed throughout; protostellae absent; ordinary stellae dense to very dense, 0.05–0.1 mm apart, 0.2–0.4 mm across, sessile; lateral rays 6–8, porrect or ascending; central ray 0.7–1.3 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs present throughout, 0.5–1 mm apart. *Lower leaf surface* yellowish, or rusty; prickles absent; stellae very dense, 0.05–0.1 mm apart, 0.2–0.4 mm diameter, stalks 0–0.3 mm long; lateral rays 7–9, porrect; central ray 0.7–1.4 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Inflorescence* supra-axillary, pseudo-racemose, common peduncle 6–12 mm long, rachis prickles absent; 2–5-flowered, weakly andromonoecious, flowers 5-merous; pedicels 3–10 mm long at anthesis, markedly thicker distally, 1–2 mm thick at mid-point, prickles absent. Calyx tube 2.5–4.5 mm long, lobes attenuate or rostrate, 1–10 mm long; prickles absent at anthesis; stellae very dense, white to brown or rusty, 0.3–0.5 mm across, stalks 0.1–0.4 mm long, lateral rays 7–10, central ray 0.8–1.5 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. Corolla mauve or purple, 10–14 mm long, deeply lobed, inner surface densely stellate-hairy; anthers 4.5–6.5 mm long; ovary with Type 2 hairs only, or with stellate and Type 2 hairs; functional style 8–10 mm long, erect, with Type 2 hairs only. *Fruiting calyx* with lobes less than half length of mature fruit, prickles absent. Mature fruits 1 per inflorescence, globular, 14–16 mm diameter, yellowish-green or pale green with dark green streaks, 4-locular; placenta in cross-section stalked, anvil-shaped; mesocarp moist but not juicy; exocarp 0.8–1.1 mm thick; pedicels 5–15 mm long in fruit, 0.8–2.5 mm thick at mid-point; seeds pale yellow or brown to black, 2.5–3.5 mm long. **Fig. 39.**

***Specimens examined*: Queensland.** Mitchell District: E of Jericho, Jul 1934, *Blake* 6814 (BRI). Leichhardt District: Injune–Rolleston road, *c.* 10 km from Injune on Rolleston road, Sep 1974, *Moriarty* 1554 (BRI, CANB); 'Anchor', 28 km SW of Duaringa, Mar 1982, *Anderson* 2969 (BRI); 'Morabinda', Taroom Shire, Jun 1993, *Schefe* CS7534 (BRI); Isla Gorge N.P., Jan 2000, *McDonald* KRM237 (BRI). Port Curtis District: S.F.69 Dawes Range, SE of Thangool, Mar 1996, *Bean* 10113 (BRI); 16 km NNE of Biloela, T.R.170, Mar 1996, *Thompson* BIL236 & *Price* (AD, BRI). Warrego District: 0.4 km W of Gee Gee Gap, Mt Moffatt N.P., Dec 1997, *Bean* 12904 (BRI). Maranoa District: *c.* 10 miles [16 km] W of Mitchell, May 1949, *Everist* 3745 (BRI); Moonie Highway, 61.2 km E of St George, Aug 1961, *Phillips* 442 (BRI, CANB); 'Deemfern', 53 miles [85 km] SW of Roma, Feb 1962, Nancarrow (BRI); 'Windamore', *c.* 40 miles [64 km] ESE of St George, Feb 1967, *Pedley* 2187 (BRI); Chesterton Range, *c.* 54 km N from Mungallala, Sep 1993, *Purdie* 4414 (BRI, CANB); near Coomrith Road, *c.* 25 km SSW of Glenmorgan, Apr 2001, *Bean* 17664 & *Pedley* (BRI, MEL, NSW). Burnett District: Fontainea Scrub, S.F.172, Gurgeena Plateau, Mar 1994, *Forster* PIF15067 (AD, BRI, MEL); S.F.215, *c.* 20 km ESE of Monto, Aug 1995, *Bean* 8817 (BRI). Darling Downs



QUEENSLAND HERBARIUM (BRI)
Flora of Queensland Darling Downs

Solanum

Coll. A.R.Bean 16662 28 MAY 2000

27°08'S 150°28'E Alt. m.
Depth m.

Spinifex Road, 16km N of Tara.
(GPS 27 08 20 150 28 58).
Flat area
Woodland of Eucalyptus crebra, E. exserta, Acacia burrowii.
Sandy soil.
Branched shrub, 1.4m high. Prickles very sparse on trunk and large branches. Fruits ripe, green with dark brown marks.
Common at site.
Spirit material at BRI.
Specimen of juvenile plant included.

Det. 280 Solanaceae
Dups. NSW MEL
*May be cited as computerised collection number **AQ 490590**
(Archival Paper)

QUEENSLAND HERBARIUM (BRI)
Brisbane Australia
AQ 490590
Sheet 1 of 2

HOLOTYPE Queensland Herbarium (BRI)
Solanum jucundum A.R. Bean
Det. A.R. Bean Date 1 OCT 2003

Fig. 39. Holotype of ***Solanum jucundum***.

District: NNW of Bungunya, Jul 1945, *Blake* 15860 (BRI); 'Cypress Downs', *c.* 15 miles [24 km] NW of Jackson, Apr 1951, *Everist s.n.* (BRI); 'Lapunyah', 42 miles [68 km] NW of Goondiwindi, Jul 1958, *Johnson* 511 (BRI, CANB); Coomrith area near Meandarra, Jul 1969, *Webb & Tracey* 8300 (AD, BRI, CANB, K, L); Chinchilla–Miles road, *c.* 10 km from Miles, Sep 1974, *Moriarty* 1553 (AD, BRI, CANB); Gurulmundi–Woleebee road, 11 km W of Gurulmundi, Oct 1975, *Williams* 75053 (BRI). **New South Wales.** North West Plains: Narrabri West, Jun 1907, *Boorman s.n.* (NSW). Central Western Slopes: Newell Highway, 35 miles [56 km] SW of Dubbo towards Peak Hill, Nov 1969, *Coveny* 2514 (BRI, NSW).

***Distribution and habitat*:** *Solanum jucundum* is widely distributed in Queensland south of the Tropic of Capricorn, especially in the western Darling Downs and Maranoa districts (**Map 25**). It also extends to central-western New South Wales, as far south as Peak Hill. It inhabits stony or sandy ridges in shrubby eucalypt woodland; the dominant species often include *Eucalyptus crebra, E. citriodora, E. melanophloia* or *Acacia catenulata*.

***Phenology*:** Flowers are recorded for every month of the year; mature fruits from September to June.

***Notes*:** *S. jucundum* is closely related to *S. tetrathecum*, but differs by the moderate to very dense indumentum of the upper leaf surface, perennial habit and greater height (up to 1.8 m high), the acute leaf apex, the rostrate to attenuate calyx lobes, the calyx stellae with stalks 0.1–0.4 mm long (0–0.1 mm for *S. tetrathecum*) and the style bearing Type 2 hairs only (Type 2 hairs and stellate hairs for *S. tetrathecum*). The distributions of *S. jucundum* and *S. tetrathecum* overlap considerably, especially around Glenmorgan, Hannaford and Westmar, but they never grow together and there is no intergradation between them.

***Conservation status*:** Widespread. Not considered at risk.

***Etymology*:** From the Latin *jucundus*, pleasing or agreeable. Well developed plants have a dense canopy of leaves and provide a showy display of flowers.

69. Solanum centrale J.M.Black, Trans. & Proc. Roy. Soc. South Australia 58: 180 (1934). **Type:** Northern Territory. 'Macdonald Downs' Station, *anno* 1932, *J. Chalmers s.n.* (lecto: K), *fide* Symon (1981), photo seen.

Erect, herbaceous resprouter, 0.2–0.4 m high. Juvenile stage unknown. Adult stem prickles present. Adult branchlets yellow, rusty or brown; prickles absent or present, 0–2 per decimetre, straight, acicular, 4–7 mm long, 7–10 times longer than wide; stellae very dense, 0.5–0.6 mm diameter, stalks 0–0.2 mm long; lateral rays 7 or 8, porrect; central ray 0.8–1.2 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Adult leaves* ovate, entire; lamina 2.8–8.5 cm long, 1.1–4.2 cm wide, 2–2.5 times longer than broad, apex obtuse or acute, base cuneate to cordate, oblique part 0–1.5 mm long, obliqueness index 0–4 percent; petioles 0.8–2.6 cm long, 17–40% length of lamina, prickles absent. *Upper leaf surface* grey-green or grey; prickles absent; stellate hairs distributed throughout; protostellae absent; ordinary stellae dense to very dense, 0.05–0.2 mm apart, 0.5–0.7 mm across, stalks 0–0.2 mm long; lateral rays 7 or 8, porrect; central ray 0.7–1.1 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Lower leaf surface* white, yellowish or rusty; prickles absent; stellae very dense, 0.05–0.1 mm apart, 0.5–0.8 mm diameter, stalks 0.1–0.3 mm long; lateral rays 6–8, porrect; central ray 0.7–1.1 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Inflorescence* supra-axillary, pseudo-racemose, common peduncle 4–23 mm long, rachis prickles absent; 1–4-flowered, flowers 5-merous; pedicels 5–7 mm long at anthesis, same thickness throughout or markedly thicker distally, 0.9–1.3 mm thick at mid-point, prickles absent. Calyx tube *c.* 4 mm long, lobes rostrate, 3–4 mm long; prickles absent at anthesis; stellae very dense, brown or rusty, 0.4–0.5 mm across, stalks 0–0.2 mm long, lateral rays 7 or 8, central ray 0.7–1.2 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. Corolla mauve or purple, 10–13 mm long, shallowly or deeply lobed, inner surface sparsely to densely stellate-hairy; anthers 4.3–6.2 mm long; ovary glabrous; functional style *c.* 9 mm long, erect, glabrous. *Fruiting calyx* with lobes less than or more than half length of mature fruit, prickles absent. Mature fruits 1 per inflorescence, globular; pedicels *c.* 15 mm long in fruit, *c.* 1 mm thick at mid-point.

Specimens examined: **Queensland.** Mitchell District: Idalia N.P., WSW of Blackall, along Emmet Pocket road, Sep 1992, *Bennie s.n.* (BRI). Warrego District: Idalia N.P., Round Hole, Mar 1996, *Forster* PIF18891 & *Ryan* (BRI); Chesterton Range N.P., south-west corner, Jul 2001, *Dollery* 266 (BRI).

Distribution and habitat: *Solanum centrale* is of restricted occurrence in Queensland, known only from Idalia and Chesterton Range National Parks (**Map 24**). It is widespread in the southern part of Northern Territory and adjacent areas of South Australia and Western Australia. The habitat for Queensland populations is recorded as "*Acacia aneura* woodland or tall shrubland on red sand".

***Phenology*:** Flowers are recorded for March, July and September; mature fruits not seen.

***Notes*:** *Solanum centrale* has not been recorded for Queensland before. The specimens cited above are a good match for specimens from the Northern Territory, including the type. However, the N.T. material tends to have leaves more rusty in colour, shorter prickles, and stellae with a somewhat shorter central ray. Further Queensland material, particularly of the fruits, is needed to confirm the identity. *S. centrale* is closely related to *S. jucundum*, but differs by its lower stature; the much larger stellae of the branchlets, upper and lower leaf surfaces; absence of Type 2 hairs from the upper leaf surface; and the glabrous ovary.

S. centrale produces an edible fruit, which was highly prized by the Aboriginal tribes of central Australia (Latz 1995).

***Conservation status*:** Although very restricted in Queensland, this species is common and widespread in central Australia.

70. Solanum cinereum R.Br., Prodr. 446 (1810). **Type:** New South Wales: "banks of the Grose" [River], "1804" [October–November 1803], *R. Brown* (holo: BM (Bennett No. 2678)).

***Illustration*:** Cunningham *et al.* (1981: 595); Symon (1981: 259).

Sprawling or erect, rhizomatous perennial shrub, 0.3–0.7 m high. Leaves (in outline) broadly ovate; lamina 5–9.5 cm long, 4–9 cm wide. Adult branchlets grey or mauve; prickles 15–60 per decimetre, straight, acicular, 3–10 mm long, 11–16 times longer than wide; stellae dense to very dense, 0.35–0.5 mm diameter, stalks 0–0.1 mm long; lateral rays 8–14, porrect; central ray 0.5–1 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Adult leaves* ovate or broadly ovate, deeply lobed throughout; lobes 3–5 on each side, acute or obtuse, lobing index 2.7–5; lamina 5.5–12.5 cm long, 3.5–5.5 cm wide, 1.4–2.5 times longer than broad, apex obtuse or acute, base cuneate or obtuse, oblique part 0–12 mm long, obliqueness index 0–12 percent; petioles 1.7–3.3 cm long, 20–50% length of lamina, prickles present. *Upper leaf surface* green; prickles 13–65, straight, acicular, 2–10 mm long, prickles present on midvein and lateral veins; stellate hairs confined to midrib, or distributed throughout; protostellae absent; ordinary stellae very sparse to sparse, 0.9–2.5 mm apart, 0.2–0.4 mm across, sessile; lateral rays 6–8, porrect; central ray 1–2 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Lower leaf surface* white or yellowish; prickles 20–45, straight, acicular, present on midvein and lateral veins; stellae very dense, *c.* 0.05 mm apart, 0.4–0.7 mm diameter, stalks 0–0.2 mm long; lateral rays 7 or 8, porrect; central ray 0.5–1.5 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Inflorescence* supra-axillary, pseudo-racemose, common peduncle 0–18 mm long, rachis prickles present; 3–6-flowered, weakly andromonoecious, flowers 5-merous; pedicels 7–16 mm long at anthesis, same thickness throughout, 0.8–1 mm thick at mid-point, prickles present. Calyx tube 2.5–3.8 mm long, lobes attenuate, 2.5–4 mm long; prickles present at anthesis, 20–65 per flower, 1–7 mm long; stellae dense, transparent or purple, 0.4–0.5 mm across, sessile, lateral rays 7–11, central ray 0–0.5 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. Corolla purple, 11–15 mm long, rotate, inner surface sparsely stellate-hairy; anthers 4–5.5 mm long; ovary glabrous; functional style 6–10 mm long, erect, with stellate hairs only. *Fruiting calyx* with lobes less than half length of mature fruit, prickles 2–7 mm long. Mature fruits 1–4 per inflorescence, globular, 17–28 mm diameter, yellowish-green or pale green with dark green streaks, glabrous or with a few scattered stellate hairs, 2-locular; mesocarp moist but not juicy; exocarp 2–4.5 mm thick; pedicels 15–27 mm long in fruit, 1.2–1.4 mm thick at mid-point; seeds brown to black, 2.9–3.7 mm long. *Narrawa Burr.*

***Specimens examined*:** **Queensland.** Darling Downs District: The Summit, Apr 1954, *Hall* (BRI); Glenlyon–Mingoola area, Apr 1957, *Taylor* (BRI); Severnlea, Stanthorpe district, May 1961, *Morwood* (BRI); Bendee near Stanthorpe, Mar 1973, *Newton* (BRI); Inglewood, Sep 1973, *O'Donohue* (BRI); 5.4 km E of 'Arcot', ENE of Texas, May 2000, *Bean* 16651 (BRI, MEL, NSW); S.F.444, Durikai, Herries Range, Nov 2001, *Forster* PIF27745 (BRI, MEL). **New South Wales.** North West Slopes: 60 km E of Bonshaw towards Tenterfield, Aug 1975, *Coveny* 6665 (BRI, NSW)

***Distribution and habitat*:** In Queensland, *Solanum cinereum* is confined to the Warwick–Texas–Stanthorpe area (**Map 25**), but it is widespread in New South Wales. It grows in shrubby eucalypt or *Eucalyptus-Callitris* woodland.

***Notes*:** for more information, see Bean (2001).

***Conservation status*:** Widespread. Not considered at risk.

71. Solanum nobile A.R.Bean, Telopea 9: 645 (2001). **Type:** New South Wales: Northern Tablelands: Gwydir Highway, Gibraltar Range National Park, 0.7 km east of watershed, 8 September 2000, *A.R. Bean* 16850 (holo: BRI; iso: AD, K, MEL, NSW).

Solanum sp. 5 in Ross (1986).

***Illustration*:** Bean (2001: 647); N. & H. Nicholson, Australian Rainforest Plants IV, p. 64 (1994), as *S.* sp. aff. *cinereum.*

Erect, rhizomatous perennial shrub, 1.5–4 m high. Leaves (in outline) ovate or broadly ovate, deeply lobed, with 2–4 pairs of lobes; lamina 9–24 cm long, 5.5–17 cm wide, with *c.* 60 prickles on upper surface. Adult branchlets white or grey; prickles 2–30 per decimetre, straight, acicular or broad-based, 3–9 mm long, 6–10 times longer than wide; stellae dense, 0.2–0.3 mm diameter, sessile; lateral rays 6–7, porrect; central ray absent or present, 0–1 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Adult leaves* ovate or broadly ovate, shallowly to deeply lobed throughout; lobes 2–4 on each side, acute, lobing index 1.7–4; lamina 7–14 cm long, 3–5 cm wide, 1.4–2.7 times longer than broad, apex acute, base obtuse or cordate, oblique part 1–8 mm long, obliqueness index 1–6 percent; petioles 1.3–3.5 cm long, 17–26% length of lamina, prickles absent or present. *Upper leaf surface* green; prickles 0–10, straight, acicular, 4–10 mm long, prickles absent or present on midvein only or present on midvein and lateral veins; stellate hairs distributed throughout; protostellae present; ordinary stellae sparse, 0.4–0.5 mm apart, 0.15–0.25 mm across, sessile; lateral rays 6–8, porrect; central ray 0–0.5 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Lower leaf surface* white or yellowish; prickles 0–2, straight, acicular, absent or present on midvein only; stellae very dense, *c.* 0.05 mm apart, 0.35–0.45 mm diameter, sessile; lateral rays 6 or 7, porrect; central ray 0–0.5 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Inflorescence* supra-axillary, pseudo-racemose, common peduncle 0–6 mm long, rachis prickles absent or present; 4–9-flowered, weakly andromonoecious, flowers 5-merous; pedicels 10–17 mm long at anthesis, markedly thicker distally, 0.7–1.2 mm thick at mid-point, prickles absent or present. Calyx tube 3–6 mm long, lobes attenuate, 5–8 mm long; prickles absent or present at anthesis, 0–5 per flower, 2–5 mm long; stellae dense, transparent or purple, 0.4–0.7 mm across, stalks 0–0.3 mm long, lateral rays 6–8, central ray 1–1.5 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. Corolla purple, 10–17 mm long, rotate, inner surface glabrous; anthers 4–5.5 mm long; ovary with Type 2 hairs only; functional style 9–10 mm long, erect, with Type 2 hairs only or with stellate and Type 2 hairs, lateral rays 7–9. *Fruiting calyx* with lobes less than half length of mature fruit, prickles absent or present, 4–7 mm long. Mature fruits 1–3 per inflorescence, globular, 18–24 mm diameter, pale green with dark green streaks, 2-locular; placenta in cross-section stalked, anvil-shaped; mesocarp moist but not juicy; exocarp 0.8–1 mm thick; pedicels 15–24 mm long in fruit, 1.2–1.6 mm thick at mid-point; seeds pale yellow, 2.5–2.8 mm long.

***Specimens examined*:** **Queensland.** Darling Downs District: Main Range, 24 km ENE of Killarney, Oct 1968, *Everist* 8124 (BRI); The Heads, 36 km SSW of Boonah on road to Killarney, Aug 1972, *Henderson* 1335 & *Sharpe* (AD, BRI); The Head, E of Killarney, Sep 1982, *Bird* (BRI); 0.7 km W of Moss Gardens, E of Killarney, Sep 2002, *Bean* 19367 (AD, BRI, NSW). **New South Wales.** North Coast: on top of Tooloom Range, near Acacia Creek, Sep 1908, *Dunn* (BRI); at Rory's road T/O, Ewingar S.F., south of Tabulam, Feb 2001, *Bean* 17329 (BRI).

***Distribution and habitat*:** In Queensland, *Solanum nobile* is known only from the Killarney area, but several populations are known in New South Wales as far south as Bellingen River (**Map 27**). It grows in notophyll rainforest, or in tall wet sclerophyll forest dominated by *Eucalyptus saligna*.

***Notes*:** for more information, see Bean (2001).

***Conservation status*:** Applying the IUCN guidelines (IUCN. 2001), a category of "Vulnerable" is recommended (VU B1ab(ii,iii)+2ab(ii,iii); C2a(i)).

72. Solanum limitare A.R.Bean, Telopea 9: 653 (2001). **Type:** Queensland. Moreton district: adjacent to Mt Binga S.F., 11 km SE of Cooyar, 21 February 2000, *A.R. Bean* 16080 (holo: BRI; iso: MEL, NSW).

***Illustration*:** Symon (1981: 147), as *S. elegans*; Bean (2001: 647).

Erect, herbaceous resprouter, 0.3–0.8 m high. Juvenile branchlets with 10–30 prickles per dm, 2–7 mm long; leaves (in outline) lanceolate or ovate, shallowly to deeply lobed, with 1–3 pairs of lobes; lamina 6.5–13 cm long, 3–8 cm wide, with 5–15 prickles on upper surface. Adult branchlets grey or rusty; prickles 1–6 per decimetre, straight, acicular, 3–7 mm long, 7–9 times longer than wide; stellae very dense, 0.25–0.4 mm diameter, stalks 0–0.1 mm long; lateral rays 6–8, porrect; central ray absent or present, 0–0.5 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Adult leaves* narrow lanceolate or lanceolate, entire; lamina 7–10.5 cm long, 0.9–1.7 cm wide, 4.5–8.5 times longer than broad, apex acute, base obtuse, oblique part 1–3.5 mm long, obliqueness index 1–4 percent; petioles 0.7–2.2 cm long, 8–30% length of lamina, prickles absent or present. *Upper leaf surface* grey-green; prickles 0–7, straight, acicular, 1–6 mm long, prickles absent or present on midvein only; stellate hairs distributed throughout; protostellae absent or present; ordinary stellae sparse to moderate density, 0.2–0.6 mm apart, 0.3–0.5 mm across, sessile; lateral rays 6–8, porrect; central ray 0–0.5 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Lower leaf surface* white or yellowish; prickles 0–6, straight, acicular, absent or present on midvein only; stellae very dense, *c.* 0.05 mm apart, 0.35–0.45 mm diameter, sessile; lateral rays 7 or 8, porrect; central ray 0.5–1 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Inflorescence* supra-axillary, pseudo-racemose, common peduncle 0–5 mm long, rachis prickles absent; 3–8-flowered, weakly andromonoecious, flowers 5-merous; pedicels 11–20 mm long at anthesis, same thickness throughout, 0.7–0.9 mm thick at mid-point, prickles absent. Calyx tube 2.5–4 mm long, lobes deltate or attenuate, 3–5 mm long; prickles absent or present at anthesis, 0–2 per flower, 1–4 mm long; stellae dense, transparent, 0.3–0.45 mm across, stalks 0–0.1 mm long, lateral rays 7 or 8, central ray 0.5–1 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. Corolla purple, 9–15 mm long, rotate, inner surface sparsely stellate-hairy; anthers 3.5–5.5 mm long; ovary with stellate and Type 2 hairs; functional style 8–12 mm long, erect, with stellate hairs only, stellae 0.3–0.4 mm across, lateral rays 8–20, central ray 1–1.5 times as long as laterals. *Fruiting calyx* with lobes less than half length of mature fruit, prickles absent. Mature fruits 1–3 per inflorescence, globular, 14–17 mm diameter, pale green with dark green streaks, 2-locular; placenta in cross-section stalked, anvil-shaped; mesocarp moist but not juicy; exocarp *c.* 0.5 mm thick; pedicels 16–20 mm long in fruit, 1.3–1.6 mm thick at mid-point; seeds white or pale yellow, 2.7–2.9 mm long.

***Specimens examined*:** **Queensland.** Burnett District: Bunya Mtns, Oct 1919, *White s.n.* (BRI). Darling Downs District: Highfield, Main Range, Dec 1875, *Bancroft* (BRI); Bunya Mtns, between Ghinghion Lookout and Summerhill View, Oct 1989, *Bird* (BRI); Condamine Gorge, Paddys Knob, Lot 13, Parish of Emuvale, Mar 1993, *Sparshott* KM40 (BRI); Mt Mitchell walking track, Jan 2003, *Hines* (BRI). Moreton District: Mt Mistake, Jun 1887, *Simmonds* (BRI); Main Range, between Spring Bluff and Murphys Creek, Aug 1930, *White* 7017 (BRI); Ben Lomond Peak, Jan 1988, *Bird* (BRI); near Boonah border gate, Croftby road, Jan 1990, *Forster* 6210 (BRI); 3.6 km along Duck Creek road, near

O'Reillys Guest House, Mar 2001, *Bean* 17393 (BRI). **New South Wales.** NORTH COAST: Tooloom, Nov 1949, *Webb* 2188 (BRI); E of Mt Boorabee, near Kyogle, Jan 1963, *Salasoo* 2583 (NSW); 20 metres S of border fence, 2 km W of Mt Lindesay, Jan 2001, *Bean* 17238 (BRI, NSW).

Distribution and habitat: *Solanum limitare* extends from the Bunya Mountains in Queensland to Kyogle in New South Wales (**Map 26**). It grows in grassy to somewhat shrubby eucalypt woodland, usually not far from a rainforest edge.

***Notes*:** for more information, see Bean (2001).

***Conservation status*:** Applying the IUCN guidelines (IUCN. 2001), a category of "Vulnerable" is recommended (VU B1ab(ii,iii)+2ab(ii,iii); C2a(i)).

73. Solanum amblymerum Dunal in A.DC., *Prodr.* 13(1): 294 (1852); *S. violaceum* var. *amblymerum* (Dunal) Maiden & Betche, *Census N.S.W. Pl.* 181 (1916). **Type:** New South Wales: Macquarie River, October 1822, *A. Cunningham* 90 (holo: G-DC *n.v.*, microfiche 13/1: 294.692; iso: K, NSW).

Erect, rhizomatous perennial shrub, 0.8–1.8 m high. Juvenile branchlets with 15–25 prickles per dm, 5–9 mm long; leaves (in outline) lanceolate, shallowly to deeply lobed, with 1 or 2 pairs of lobes; lamina 7–10 cm long, 1.5–2.5 cm wide, with 3–5 prickles on upper surface. Adult branchlets grey; prickles 1–10 per decimetre, straight, acicular, 5–9 mm long, 7–10 times longer than wide; stellae very dense, 0.3–0.4 mm diameter, sessile; lateral rays 7–10, porrect; central ray absent or present, 0–0.5 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Adult leaves* linear or narrow lanceolate, entire or with obtuse basal lobes only; lamina 5–11 cm long, 0.5–1.3 cm wide, 6–13 times longer than broad, apex obtuse or acute, base cuneate, obtuse or hastate, oblique part 0–1.5 mm long, obliqueness index 0–2 percent; petioles 0.3–0.9 cm long, 5–15% length of lamina, prickles absent or present. *Upper leaf surface* green; prickles 1–7, straight, acicular, 4–10 mm long, prickles present on midvein only; stellate hairs distributed throughout; protostellae present; ordinary stellae very sparse to sparse, 0.4–0.7 mm apart, 0.1–0.2 mm across, sessile; lateral rays 7 or 8, porrect; central ray 0–0.5 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Lower leaf surface* white or yellowish; prickles 0–5, straight, acicular, absent or present on midvein only; stellae very dense, *c.* 0.05 mm apart, 0.2–0.45 mm diameter, sessile; lateral rays 7 or 8, porrect; central ray 0.5–1 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Inflorescence* supra-axillary, pseudo-racemose, common peduncle 1–11 mm long, rachis prickles absent; 3–6-flowered, weakly andromonoecious, flowers 5-merous; pedicels 5–10 mm long at anthesis, same thickness throughout, 0.8–0.9 mm thick at mid-point, prickles absent. Calyx tube 1.5–2.5 mm long, lobes deltate or attenuate, 2.5–4.5 mm long; prickles absent at anthesis; stellae dense, transparent or purple, 0.25–0.4 mm across, stalks 0–0.1 mm long, lateral rays 7 or 8, central ray 0.5–1 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. Corolla purple, 8–14 mm long, rotate, inner surface glabrous or sparsely stellate-hairy; anthers 4.5–6.5 mm long; ovary with Type 2 hairs only; functional style 8–11 mm long, erect, with stellate and Type 2 hairs, stellae 0.4–0.5 mm across, lateral rays 8–11, central ray *c.* 1 times as long as laterals. *Fruiting calyx* with lobes less than half length of mature fruit, prickles absent. Mature fruits 1–3 per inflorescence, oblate or globular, 11–16 mm diameter, pale green with dark green streaks, 2-locular; placenta in cross-section stalked, anvil-shaped; mesocarp moist but not juicy; exocarp 0.7–0.8 mm thick; pedicels 9–13 mm long in fruit, 0.9–1.4 mm thick at mid-point; seeds white or pale yellow, 2.3–3 mm long.

***Specimens examined*:** **Queensland.** DARLING DOWNS DISTRICT: Stanthorpe, Jul 1904, *Boorman* (BRI); Silverwood, Sep 1922, *White* 1765 (BRI); granite hill W of Glen Aplin, Nov 1946, *Everist* 1362 (BRI); 'Benandre', 23 miles [34 km] SE of Texas, Apr 1962, *Pedley* 985 (BRI); Thulimbah, 4 miles [6 km] N of Stanthorpe, Oct 1967, *Greeness* (BRI); 1.6 km W of Cottonvale, Oct 1975, *Williams* 75096 (BRI); S.F.595, near Mt Gammie North, Sep 1992, *Forster* 11723 (BRI); Sundown N.P. near Red Rock Gorge road to Severn R., Jan 1993, *Forster* PIF12677 (AD, BRI); Mt Janet road, Passchendaele S.F., NW of Stanthorpe, Oct 1997, *Bean* 12471 (BRI); 1 km S of Crystal Mt turnoff, N of Dalveen, Nov 1999, *McDonald* KRM94 (BRI). MORETON DISTRICT: ridge SW of Mt Hennessy, Black Duck Ck, 'Glenrock', Mar 1997, *Grimshaw* PG2694 (AD, BRI). **New South Wales.** NORTHERN TABLELANDS: Roberts Range, W of 'Donnybrook', via

Wallangarra, Feb 1990, *Bean* 1358 (BRI); 9.9 km S of Boonoo Boonoo River, Mt Lindesay Hwy, Jan 1992, *Wilson* 1321 (BRI, NSW); lookout 1 km S of Emmaville, Jan 2001, *Bean* 17293 (BRI, NSW).

***Distribution and habitat*:** In Queensland, *Solanum amblymerum* is known from the Granite Belt and adjacent areas (**Map 28**). It is also common on the north-western slopes of N.S.W. It grows in shubby eucalypt or *Eucalyptus*-*Callitris* woodland on sandy to loamy soils.

***Notes*:** for more information, see Bean (2001).

***Conservation status*:** Widespread. Not considered at risk.

74. Solanum galbinum A.R.Bean **sp. nov.** Frutex erectus sparse foliatus, in ramulis sparse aculeatus; folia adulta linearia, 3–6 mm lata, petiolis 2–3 mm longis (3–7% longitudinis laminae); protostellae a pagina superiore folii absentes; calycis aculei absentes; corolla profunde lobata, pagina interna sparse stellato-pilosa; fructus maturi 10–15 mm diametro, virides cum striis obscurioribus viridibus; placenta sessilis; semina 3.5–4 mm longa. **Typus:** Queensland. South Kennedy District: Mt Coolon–Collinsville road, 0.8 km W of Caves Creek, 20 January 1996, *I.G. Champion* 1310 & *A.B. Pollock* (holo: BRI).

Solanum sp. (Mt Coolon I.G. Champion+ 1310) in Henderson (2002).

Erect, rhizomatous perennial shrub, 0.5–1.5 m high. Juvenile stage unknown. Adult branchlets rusty or brown; prickles 10–40 per decimetre, straight, acicular, 3–8 mm long, 8–13 times longer than wide; stellae very dense, 0.35–0.5 mm diameter, sessile; lateral rays 7 or 8, porrect; central ray 0.4–0.8 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Adult leaves* linear, entire; lamina 4–7 cm long, 0.3–0.6 cm wide, 8.5–17 times longer than broad, apex obtuse or acute, base cuneate, oblique part 0–2 mm long, obliqueness index 0–3 percent; petioles 0.2–0.3 cm long, 3–7% length of lamina, prickles absent. *Upper leaf surface* green; prickles 0–6, straight, acicular, 1.5–7 mm long, prickles absent or present on midvein only; stellate hairs distributed throughout; protostellae absent; ordinary stellae sparse to moderate density, 0.15–0.4 mm apart, 0.2–0.3 mm across, sessile; lateral rays 7 or 8, porrect; central ray 0.7–1.3 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Lower leaf surface* white; prickles absent; stellae very dense, *c.* 0.05 mm apart, 0.4–0.5 mm diameter, stalks 0–0.15 mm long; lateral rays 7 or 8, porrect; central ray 0.4–0.8 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Inflorescence* supra-axillary, pseudo-umbellate or pseudo-racemose, common peduncle 0–4 mm long, rachis prickles absent; 4–9-flowered, weakly andromonoecious, flowers 5-merous; pedicels 4–6 mm long at anthesis, same thickness throughout, 0.4–0.6 mm thick at mid-point, prickles absent. Calyx tube 1–2 mm long, lobes deltate, 1.5–2.5 mm long; prickles absent at anthesis; stellae very dense, purple, brown or rusty, 0.25–0.35 mm across, stalks 0–0.1 mm long, lateral rays 8 or 9, central ray 0.6–1.4 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. Corolla white or mauve, 7–11 mm long, deeply lobed, inner surface sparsely stellate-hairy; anthers 4–5.5 mm long; ovary with stellate hairs only, or with Type 2 hairs only; functional style 8–9.5 mm long, erect, with Type 2 hairs only or with stellate and Type 2 hairs, stellae 0.3–0.4 mm across, lateral rays 5–7, central ray 0.5–1 times as long as laterals. *Fruiting calyx* with lobes less than half length of mature fruit, prickles absent. Mature fruits 1–4 per inflorescence, globular, 10–15 mm diameter, pale green with dark green streaks, 1-locular (septum absent or incomplete); placenta in cross-section sessile, semi-circular; mesocarp juicy or moist; exocarp 0.3–0.4 mm thick; pedicels 5–9 mm long in fruit, 0.5–0.9 mm thick at mid-point; seeds pale yellow, 3.5–4 mm long. **Fig. 7, 40.**

***Specimens examined*:** **Queensland.** Burke District: White Mountains N.P., NW of 'Warang', Apr 2000, *Wannan* 1713 & *Martindell* (BRI, CANB, NSW); 13 km NW of 'Warang' HS site, White Mountains N.P., Apr 2000, *Thomas* 1817 & *Thompson* (BRI). Cook District: Newcastle Range, Feb 1928, *Brass* 1781 (BRI, CANB). North Kennedy District: 5 miles [8 km] S of 'Wairuna', Jun 1967, *Morain* 12 (BRI); near Reeve's Lake, *c.* 25 km W of junction of Lolworth Ck and Burdekin River, Jul 1981, *Henderson* H2658 (AD, BRI); 'Valley of Lagoons', *c.* 10.5 km E of HS, Apr 1989, *Clarkson* 7929 & *Henderson* (BRI); 2.5 km W of Clermont turn-off

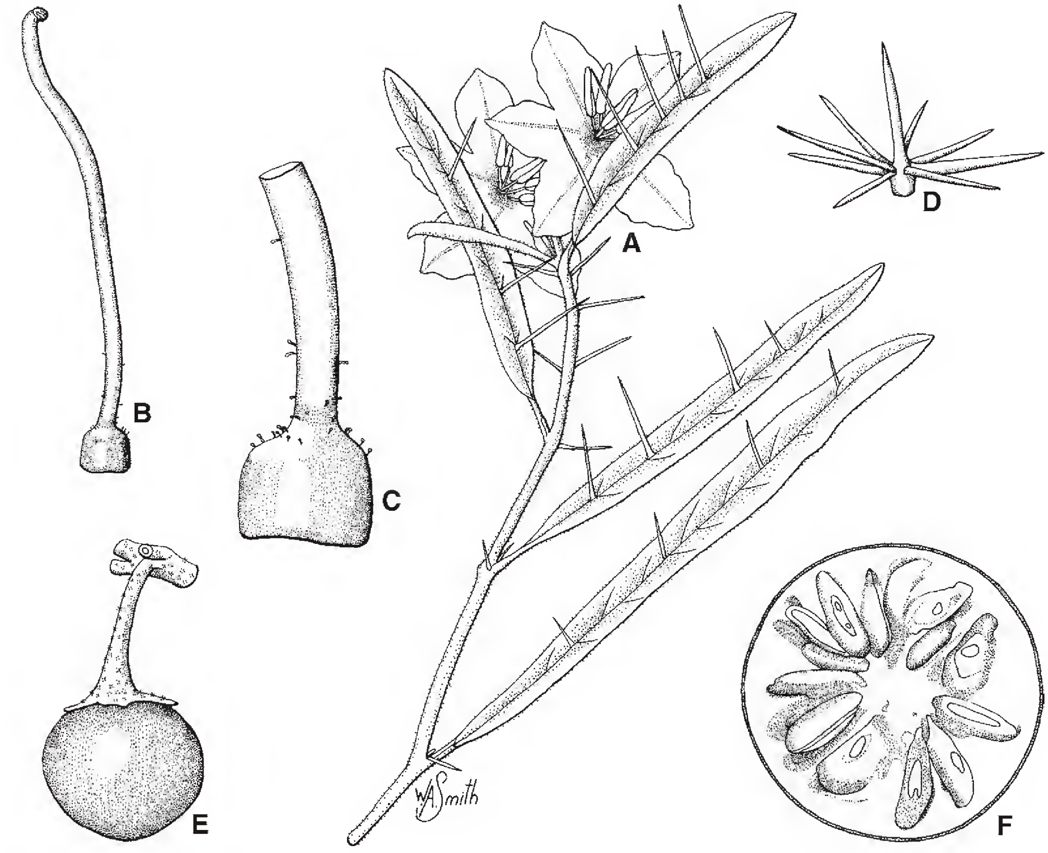


Fig. 40. ***Solanum galbinum***. A. flowering branchlet × 1.5. B. ovary and style × 6. C. ovary with Type 2 hairs × 16. D. stellate hair, upper leaf surface × 100. E. mature fruit and pedicel × 2. F. transverse section of fruit × 4. A, D, *Thompson* BUC455 & *Sharpe*; B–C, E–F, *Thomas* 1437 & *Thompson*.

on Flinders Hwy, Charters Towers, Sep 1990, *Wilson* 607 & *Rowe* (BRI, NSW); 46 km SW of Greenvale, towards 'Wando Vale', Jun 2000, *Cumming* 19647 (BRI). MITCHELL DISTRICT: 2.6 km S of road to 'Mundoo Bluff' HS, on road to 'Thirlestone', May 1991, *Neldner* 3349 & *Thompson* (BRI); 'Fortuna', Aramac, Aug 1998, *House* AZI1576 (BRI); Poison Valley road, White Mountains N.P., Apr 2000, *McDonald* KRM439 (BRI). SOUTH KENNEDY DISTRICT: on Great Dividing Range, *c.* 21 km NNW of 'Yarrowmere' HS, *c.* 97 km SSE of Pentland, Oct 1983, *Henderson* H2852 *et al.* (BRI, CANB); Peak Downs Highway, 17 km W of Moranbah turnoff, Mar 1989, *Champion* 437 (BRI); 20 km SE of 'Teamass' HS, Jun 1992, *Thompson* BUC455 & *Sharpe* (AD, BRI); 78 km from Collinsville on Mt Coolon road, Feb 1994, *Bean* 7360 & *Forster* (BRI); 14 km SW of 'Bowie', near Lake Buchanan, Feb 1994, *Bean* 7494 & *Forster* (BRI). LEICHHARDT DISTRICT: 12.5 km W of Middlemount on Dysart road, Jul 1998, *Thompson* 1094 & *Fox* (BRI).

***Distribution and habitat*:** *Solanum galbinum* is endemic to Queensland. Distributed from Newcastle Range near Einasleigh to Middlemount and Moranbah (**Map 27**). It grows on sandstone ridges and lateritised plateaux in open eucalypt woodland or *Acacia shirleyi* forest in shallow sandy soil.

***Phenology*:** Flowers are recorded from January to October; mature fruits from January to June and in October.

***Notes*:** *S. galbinum* seems closest to *S. amblymerum*, but differs from that species by the linear leaves 3–6 mm wide and petioles only 2–3 mm long; shorter calyx lobes at anthesis and shorter fruiting pedicels; the deeply-lobed corolla; the larger seeds and the stellae of the upper leaf surface having a longer central ray.

It is of very similar appearance to *S. ferocissimum*, but that species has smaller red fruits with longer pedicels, and the upper leaf surface is glabrous or almost so.

Conservation status: Widespread. Not considered at risk.

Etymology: From the Latin *galbinus* meaning yellowish. A reference to the yellow-green fruit. Both *S. parvifolium* and *S. ferocissimum*, with which this species has been confused, have bright red fruits.

Group 27D (S. esuriale group), here defined; related to Group 27 (*S. ellipticum* group) of Whalen (1984)

Upper leaf surface stellae with 8–18 lateral rays (100%); inner surface of corolla glabrous (100%); calyx not accrescent in fruit (100%); mature fruits green, yellowish-green or brown (100%); inflorescences andromonoecious, male flowers and bisexual flowers same size and prickliness (100%); inflorescence solitary or pseudo-racemose (93%); lower leaf surface indumentum dense to very dense (90%); adult leaves entire (86%); calyx without prickles (86%); Type 2 hairs absent from leaves (86%); upper leaf surface indumentum dense to very dense (70%); seeds brown to black (50%).

14 species endemic to Australia, 8 species indigenous to Queensland.

75. Solanum elachophyllum F.Muell., Fragm. 2: 164 (1861). **Type:** [Queensland. Leichhardt District:] between the Mackenzie and Dawson Rivers, November 1856, *F. Mueller* (lecto: K; isolecto: MEL [MEL 12234]), *fide* Symon (1981).

Illustration: Symon (1981: 179).

Sprawling or erect, rhizomatous perennial shrub, 0.1–0.4 m high. Juvenile branchlets with *c.* 30 prickles per dm, 6–12 mm long; leaves (in outline) elliptical, entire; lamina 1.2–3.4 cm long, 0.6–1.5 cm wide, with 0–2 prickles on upper surface. Adult branchlets white or grey or brown; prickles 15–50 per decimetre, straight, acicular, 7–10 mm long, 11–14 times longer than wide; stellae very dense, 0.15–0.3 mm diameter, sessile; lateral rays 10–15, porrect; central ray absent or present, 0–0.3 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Adult leaves* elliptical, entire; lamina 0.5–1.5 cm long, 0.3–0.7 cm wide, 1.7–2.5 times longer than broad, apex obtuse, base cuneate, oblique part 0–0.3 mm long, obliqueness index 0–3 percent; petioles 0.1–0.3 cm long, 18–35% length of lamina, winged, prickles absent. *Upper leaf surface* green or grey-green; prickles 0–2, straight, acicular, 2–7 mm long, prickles absent or present on midvein only; stellate hairs confined to midrib, or distributed throughout; protostellae absent; ordinary stellae very sparse to dense, 0.3–0.6 mm apart, 0.15–0.25 mm across, sessile; lateral rays 8–10, porrect; central ray 0–0.2 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Lower leaf surface* greenish-white, white, or yellowish; prickles absent; stellae sparse to dense, 0.1–0.4 mm apart, 0.15–0.3 mm diameter, sessile; lateral rays 8–16, porrect; central ray 0–0.1 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Inflorescence* leaf-opposed, solitary or pseudo-racemose, common peduncle 0–1 mm long, rachis prickles absent; 1 or 2-flowered, with all flowers bisexual and 5-merous; pedicels 3–15 mm long at anthesis, same thickness throughout, 0.5–0.8 mm thick at mid-point, prickles absent. Calyx tube 2–2.5 mm long, lobes deltate, 1–2.5 mm long; prickles absent at anthesis; stellae sparse to dense, white, 0.2–0.3 mm across, sessile, lateral rays 8–12, central ray 0–0.3 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. Corolla mauve or purple, 7–10 mm long, deeply lobed, inner surface glabrous; anthers 4–5 mm long; ovary with Type 2 hairs only; functional style 6–6.5 mm long, erect, glabrous or with Type 2 hairs only. *Fruiting calyx* with lobes less than half length of mature fruit, prickles absent. Mature fruits 1 per inflorescence, globular, 12–14 mm diameter, pale green with dark green streaks, 2-locular; placenta in cross-section sessile, semi-circular; mesocarp moist but not juicy; exocarp 1.2–1.8 mm thick; pedicels 6–15 mm long in fruit, 0.6–0.9 mm thick at mid-point; seeds pale yellow or brown to black, 2.9–3.7 mm long.

Specimens examined**: Queensland.** Leichhardt District: Blackwater, E of Emerald, Mar 1920, *Francis* (BRI); Emerald, undated, *Carey* (BRI); near 'Warwick' HS, Jul 1962, *Story & Yapp* 174 (BRI, CANB); 39 miles [63 km] S of Blackwater, Jul 1964, *Gittins* 862 (BRI); *c.* 4 miles [6 km] E of Moura, March 1967, *Henderson* H220 (BRI); 'Thomby', 20 miles [32 km] NW of Theodore, Sep 1969, *Johnson* 2874 (BRI); 0.5 km N of 'Bogandilla' HS, Broadsound Shire, Feb 1979, *Anderson* 769 (BRI); Brigalow Research Station, May 1981, *Dillewaard* 621 & *Johnson* (BRI); Taunton N.P., Oct 1995, *Melzer* RM688 & *Hendry* (BRI); 3 km E of Dingo, Feb 1998, *Fairfax* 267 & *Holman* (BRI); Brigalow Research Station, SW of Moura, Dec 2001, *Bean* 18254 (BRI); Crooked Creek Dam, Junee Tableland, Oct 2002, *Bean* 19378 (BRI); 'Nirvana', *c.* 15 km WNW of Banana, Apr 2003, *Bean* 20166 (BRI).

Distribution and habitat**:** *Solanum elachophyllum* is endemic to Queensland. Confined to the central east of the state, from Middlemount to Theodore (**Map 26**). It grows on fertile cracking-clay soils in association with Brigalow (*Acacia harpophylla*), Belah (*Casuarina cristata*), Bonewood (*Macropteranthes leichhardtii*) or Dawson River Blackbutt (*Eucalyptus cambageana*).

Phenology**:** Flowers recorded for February, March, July and September; mature fruits in March, May and July.

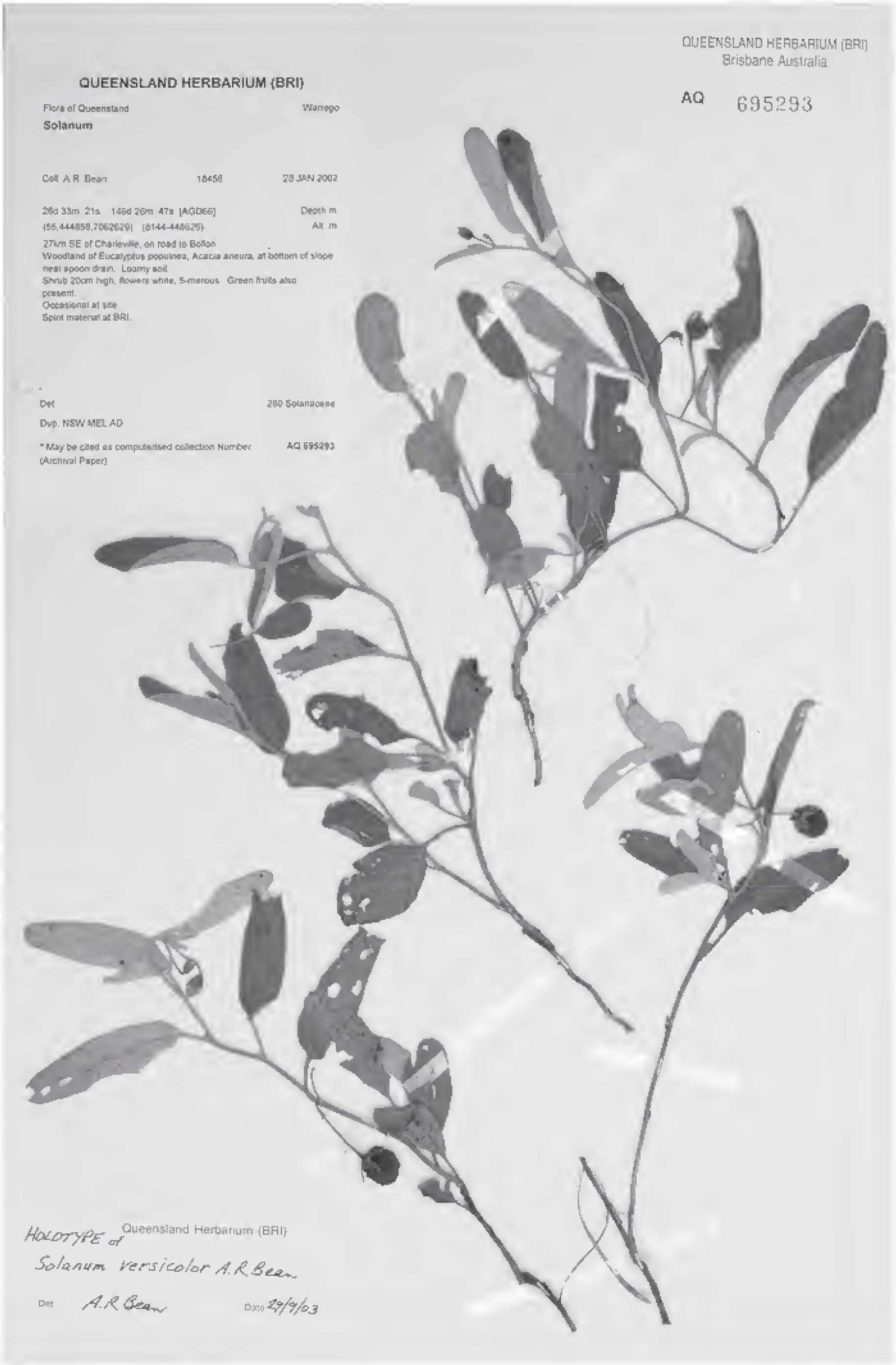
Notes**:** *S. elachophyllum* can be distinguished from all other Queensland *Solanum* species by the very small leaves (5–11 × 3–7 mm). It is apparently related to *S. esuriale* and *S. sturtianum* by virtue of its stellate hair morphology.

It would probably make an interesting horticultural subject as a pot or tub plant.

Conservation status**:** *S. elachophyllum* was first collected by Ferdinand Mueller in 1856 and has been collected in many locations since then. However, its habitat has been greatly reduced in recent decades and it is also threatened by weeds, particularly introduced pasture grasses. It is currently known from 4 locations, and it does not occur within a conservation reserve. Applying the IUCN guidelines (IUCN. 2001), a category of "Endangered" is recommended (EN A2ce; B2ab(iii,v); C1).

76. Solanum versicolor A.R.Bean **sp. nov.** Repullulator erectus herbaceus usque ad 0.3 m altus; cortex suberosus; ramuli sparse aculeati, aculeis 11–20plo longioribus quam latioribus; folia sine aculeis, pagina superior digitis ornata, pagina inferior albida; inflorescentia 1–3-flora, pedunculus communis absens; pedicelli floriferi 11–26 mm longi sub anthesi; calyx digitis praeditus sed aculeis carens; alibastra purpurascentia-albida et corolla albida; fructus maturi virides. **Typus:** Queensland. Warrego District: 27 km SE of Charleville, on road to Bollon, 28 January 2002, *A.R. Bean* 18456 (holo: BRI (1 sheet + spirit); iso: AD, MEL, NSW).

Erect, herbaceous resprouter, 0.15–0.3 m high. Juvenile stage absent. Bark on adult stems furrowed, corky. Adult branchlets yellow or brown; prickles 1–10 per decimetre, straight, acicular, 1–5 mm long, 13–20 times longer than wide; stellae dense, 0.5–0.8 mm diameter, stalks 0–0.1 mm long; lateral rays 7–9, porrect; central ray present, 0.2–0.5 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs sparse. *Adult leaves* lanceolate or elliptical, entire; lamina 3.5–6 cm long, 1.1–2.2 cm wide, 2.5–4 times longer than broad, apex obtuse, base cuneate, oblique part 0–1.5 mm long, obliqueness index 0–3 percent; petioles 0.6–1.4 cm long, 17–25% length of lamina, prickles absent. *Upper leaf surface* grey-green; prickles absent; stellate hairs distributed throughout; protostellae absent; ordinary stellae dense, 0.15–0.3 mm apart, 0.5–0.7 mm across, stalks 0–0.15 mm long; lateral rays 8–9, porrect; central ray 0.5–1 times as long as laterals, not gland-tipped; finger hairs present, 0.1–0.3 mm apart, gland-tipped, 0.05–0.1 mm long; Type 2 hairs absent. *Lower leaf surface* white; prickles absent; stellae dense to very dense, 0.05–0.1 mm apart, 0.6–0.9 mm diameter, stalks 0.1–0.2 mm long; lateral rays 7 or 8, porrect; central ray 0.4–1 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Inflorescence* supra-axillary, solitary or pseudo-racemose, common peduncle absent, rachis prickles absent; 1–3-flowered, with all flowers bisexual and 5-merous; pedicels 11–26 mm long at anthesis, same thickness throughout, 0.5–0.6 mm thick at mid-point, prickles absent. Calyx tube 1.5–3 mm long, lobes attenuate, 3–4.5 mm long; prickles absent at anthesis; stellae moderate to dense, transparent, 0.5–0.7 mm



QUEENSLAND HERBARIUM (BRI)
Brisbane Australia

AQ 695293

QUEENSLAND HERBARIUM (BRI)

Flora of Queensland Warrego

Solanum

Coll A R Bean 18458 28 JAN 2002

26d 33m 21s 146d 26m 47s [AGD66] Depth m

(55,444858,7062629) (8144-448625) Alt m

27km SE of Charleville, on road to Bollon
Woodland of Eucalyptus populnea, Acacia aneura, at bottom of slope near spoon drain. Loamy soil.
Shrub 20cm high, flowers white, 5-merous. Green fruits also present.
Occasional at site
Spirit material at BRI.

Det 280 Solanaceae

Dup. NSW MEL AD

* May be cited as computerised collection Number AQ 695293
(Archival Paper)

HOLOTYPE of Queensland Herbarium (BRI)
Solanum versicolor A.R.Bean

Det A.R.Bean Date 29/9/03

Fig. 41. Holotype of ***Solanum versicolor***.

across, stalks 0–0.1 mm long, lateral rays 6–8, central ray 0.5–1 times as long as laterals, not gland-tipped; finger hairs present; Type 2 hairs absent. Corolla white, 7–11 mm long, shallowly lobed; anthers 4–5 mm long; ovary with Type 2 hairs only; functional style 5–6.5 mm long, erect, with Type 2 hairs only. *Fruiting calyx* with lobes less than half length of mature fruit, prickles absent. Mature fruits 1 or 2 per inflorescence, globular, 11–13 mm diameter, green, 2-locular; placenta in cross-section sessile, semi-circular; mesocarp moist but not juicy; exocarp 0.4–0.5 mm thick; pedicels 12–26 mm long in fruit, 0.6–0.9 mm thick at mid-point; seeds pale yellow, 2.7–3 mm long. **Fig. 41.**

***Additional specimen examined*: Queensland.** WARREGO DISTRICT: 44 km E of Charleville, towards Morven, Jan 2002, *Bean* 18507 (AD, BRI, NSW).

***Distribution and habitat*:** *Solanum versicolor* is endemic to Queensland. Known only from around Charleville in south-western Queensland (**Map 7**). It grows on lower hillslopes with *Acacia aneura* and *Eucalyptus populnea*, on deep red earths.

***Phenology*:** Poorly known. Flowers and fruits recorded in January.

***Notes*:** *S. versicolor* is related to *S. esuriale*, but differs by: the corky bark; the presence of finger hairs on both the upper leaf surface and the calyx; the absence of a common peduncle; pedicels 11–26 mm long at anthesis (5–9 mm long for *S. esuriale*); the white corolla; and the moderate to dense stellae on the calyx (very dense for *S. esuriale*).

***Conservation status*:** Data deficient.

***Etymology*:** From the Latin *versicolor* meaning different or varying colour, a reference to the green, sparsely hairy pedicels, which contrast strongly with the white, densely hairy rachises and branchlets.

77. Solanum esuriale Lindl. in Mitchell, Three Exped. Australia 2: 43 (1838); *S. esuriale* var. *esuriale* Domin, Biblioth. Bot. 89: 583 (1929). **Type:** New South Wales. [SOUTH WESTERN PLAINS:] interior of New Holland [near Hillston], 19 April 1836, *T. Mitchell* (holo: CGE; iso: K).

Solanum esuriale var. *sublobatum* Domin, Biblioth. Bot. 89: 583 (1929). **Type:** Queensland. MITCHELL DISTRICT: near Longreach, March 1910, *K. Domin s.n.* (holo: PR, photo at BRI).

***Illustration*:** Cunningham *et al.* (1981: 590); Symon (1981: 173).

Sprawling or erect, herbaceous resprouter, 0.1–0.4 m high. Juvenile stage absent. Adult branchlets terete or ridged, grey or brown; prickles absent or present, 0–100 per decimetre, straight, acicular or broad-based, 1–4 mm long, 8–12 times longer than wide; stellae very dense, 0.7–0.9 mm diameter, stalks 0–0.2 mm long; lateral rays 8–12, porrect; central ray 0.3–1 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Adult leaves* linear to lanceolate, entire or shallowly lobed throughout; lobes 3–5 on each side, obtuse, lobing index 1–1.1; lamina 3–10 cm long, 0.7–1.4 cm wide, 3.8–14 times longer than broad, apex obtuse or acute, base cuneate, oblique part 0–2 mm long, obliqueness index 0–4 percent; petioles 0.4–1.4 cm long, 13–20% length of lamina, prickles absent or present. *Upper leaf surface* grey-green or grey; prickles absent; stellate hairs distributed throughout; protostellae absent or present; ordinary stellae density moderate to very dense, 0.05–0.4 mm apart, 0.4–0.7 mm across, sessile; lateral rays 6–12, porrect; central ray 0.5–1 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Lower leaf surface* white or yellowish; prickles absent; stellae dense to very dense, 0.05–0.4 mm apart, 0.5–0.8 mm diameter, stalks 0–0.1 mm long; lateral rays 8–14, porrect; central ray 0.3–1 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Inflorescence* supra-axillary, pseudo-racemose, common peduncle 14–36 mm long, rachis prickles absent; 3–6-flowered, with all flowers bisexual and 5-merous; pedicels 5–9 mm long at anthesis, same thickness throughout, 0.6–0.7 mm thick at mid-point, prickles absent. Calyx tube 2–3 mm long, lobes rostrate or attenuate, 2–3.5 mm long; prickles absent or present at anthesis, 0–3 per flower, 0.5–1 mm long; stellae very dense, white to rusty-brown, 0.5–0.7 mm across, stalks 0–0.1 mm long, lateral rays 6–9, central ray 0.3–1 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. Corolla mauve or purple, 8–13 mm long, shallowly lobed, inner surface glabrous; anthers 3.5–5 mm long; ovary glabrous, or with stellate hairs only; functional style 6–7 mm long, erect, glabrous or with stellate hairs only, stellae 0.5–0.7 mm across, lateral rays 6–8, central ray 0.7–1 times as long as laterals. *Fruiting calyx* with lobes less than half length of mature fruit, prickles absent or present, 1–1.5 mm long. Mature fruits 1–4 per inflorescence, globular or ellipsoidal, 12–15 mm diameter, yellowish-green or green, glabrous or with a few scattered stellate hairs, 2-locular; placenta in cross-section stalked, anvil-shaped; mesocarp moist but not juicy; exocarp 1–1.3 mm thick; pedicels 7–20 mm long in fruit, 0.9–1.1 mm thick at mid-point; seeds pale yellow, 3–4.2 mm long. *Quena.*

***Selected specimens examined*: Queensland.** BURKE DISTRICT: Lake Mary, near Camooweal, May 1935, *Blake* 8882 (BRI); Julia Ck–Normanton road, 45 km N of Julia Creek, Jul 1985, *Williams* 85057 (BRI); 14 km NE of 'Eulolo' HS, 41 km NE of McKinlay, Nov 1986, *Neldner* 2695 & *Nicolson* (BRI). NORTH KENNEDY DISTRICT: Suttors River, undated, *Bowman* (BRI, MEL); 20 km N of Charters Towers, Mar 1992, *Dorney* 295 (BRI). GREGORY NORTH DISTRICT: Eyre Creek, 8 km SE of Bedourie, Sep 1978, *Purdie* 1338 (BRI); Chartwage Bore, 'Headingley', May 1985, *Neldner* 1779 & *Stanley* (BRI). MITCHELL DISTRICT: 12 miles [19 km] S of Tambo on Ward road, Feb 1968, *Beasley* (BRI); *c.* 30 km S of Hughenden on Muttaburra road, Jun 1977, *McDonald* 2509 (BRI). SOUTH KENNEDY DISTRICT: 'Laglan' Station, *c.* 105 km WNW of Clermont, Mar 1958, *Smith* 10321 (BRI); 26.5 km NW of Belyando Crossing on Gregory Development road, Jun 1992, *Thompson* BUC619 & *Sharpe* (BRI). LEICHHARDT DISTRICT: 9 miles [14 km] WNW of Springsure, Oct 1964, *Adams* 1394 (BRI, CANB); 'Berrigurra', *c.* 19 km NW of Blackwater, Duaringa shire, Dec 1983, *Anderson* 3621 (BRI); 'Homevale' Station, Mar 1994, *Champion* 1029 *et al.* (BRI). GREGORY SOUTH DISTRICT: Old Canterbury Hotel, on Betoota–Windorah road, Mar 1990, *Sandercoe* 4096 (BRI); 21.8 km NW of Eromanga turnoff, on Quilpie–Windorah road, Aug 1990, *Prendergast* HDP293 (BRI). WARREGO DISTRICT: Oakwood Station, N of Charleville, Apr 1932, *Francis s.n.* (BRI); Eulo, Apr 1941, *White* 12016 (BRI). MARANOA DISTRICT: 'Tamanick', 80 km SE of Mitchell, Nov 1989, *Warrian* CMW396 (BRI); 44.7 km along road to 'Combo', S of Bollon, Jan 1998, *Bean* 13050 (BRI). DARLING DOWNS DISTRICT: 'Calala', 10 miles [16 km] E of Meandarra, Apr 1960, *Johnson* 1622 (BRI); 2 km NW of Dalby, Apr 1994, *Fensham* 1259 (BRI); Marnhull, SE of Jandowae, Dec 2001, *Bean* 18201 (BRI). **New South Wales.** NORTH WEST PLAINS: 10 km NNE of Ashley on Rosedale road, Mar 1987, *Dunn* 61 *et al.* (BRI, NSW); 0.4 km S of Gurley Ck, on Moree–Narrabri road, Jan 1996, *Bean* 9503 (BRI, NSW).

***Distribution and habitat*:** *Solanum esuriale* is widely distributed in Queensland, being absent only in coastal areas and the far north of the state (**Map 29**). It occurs in all mainland states. It inhabits heavy clay soils and occurs in several plant communities including grassland, open woodland of *Eucalyptus coolabah* or *E. populnea*, open forest of *Acacia harpophylla* or *A. cambagei.*

***Phenology*:** Flowers and fruits may be found at any time of the year.

***Notes*:** *S. esuriale* is often completely unarmed, but sometimes bears numerous short prickles on the stems, rarely extending to the calyx. These prickly forms appear to be randomly distributed and hence have no taxonomic significance. It is closely related to *S. elaeagnifolium* (see Notes under that species).

***Conservation status*:** Widespread. Not considered at risk.

78. *Solanum elaeagnifolium Cav., Icon. 3: 22, t. 243 (1795). **Type:** cultivated in Madrid (originating from America), undated, *A.J. Cavanilles s.n.* (iso: C, MA, P-JU), *n.v.*, *fide* D'Arcy (1974).

***Illustrations*:** Cunningham *et al.* (1981: 593); Symon (1981: 153).

Erect, herbaceous resprouter, 0.3–0.6 m high. Juvenile stage unknown. Adult branchlets terete or ridged, white or grey; prickles absent or present, 0–30 per decimetre, straight, acicular or broad-based, 0.5–1.5 mm long, 6–10 times longer than wide; stellae very dense, 0.4–0.5 mm diameter, stalks 0–0.1 mm long; lateral rays 15–18, porrect; central ray absent or present, 0–0.5 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Adult leaves* lanceolate, entire or shallowly lobed throughout; lobes 3–6 on each side, obtuse, lobing index 1–1.1; lamina 3–6.5 cm long, 0.8–1.4 cm wide, 3.9–5.2 times longer than broad, apex acute, base cuneate, oblique part 0–3 mm long, obliqueness index 0–6 percent; petioles 0.4–1.3 cm long, 13–25% length of lamina, prickles absent or present. *Upper leaf surface* grey-green or grey; prickles absent; stellate hairs distributed throughout; protostellae absent; ordinary stellae dense to very dense, 0.05–0.2 mm apart, 0.4–0.5 mm across, sessile; lateral rays 10–15, porrect; central ray 0–0.5 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Lower leaf surface* white; prickles absent; stellae very dense, *c.* 0.05 mm apart, 0.3–0.6 mm diameter, stalks 0–0.2 mm long; lateral rays 13–16, porrect; central ray 0.2–0.6 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Inflorescence* supra-axillary, pseudo-racemose, common peduncle 6–21 mm long, rachis prickles absent; 4–8-flowered, with all flowers bisexual and 5-merous; pedicels 7–14 mm long at anthesis, same thickness throughout, 0.7–0.9 mm thick at mid-point, prickles absent or present. Calyx tube 3–4.5 mm long, lobes attenuate, 3–6 mm long; prickles absent or present at anthesis, 0–35 per flower, 1–2.5 mm long; stellae very dense, white, 0.4–0.5 mm across, stalks 0–0.1 mm long, lateral rays 13–20, central ray 0.1–1 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. Corolla mauve or purple, 12–14 mm long, shallowly or deeply lobed, inner surface glabrous; anthers 7–9 mm long; ovary with stellate hairs only; functional style 11–13 mm long, erect, glabrous or with stellate hairs only, stellae 0.6–0.7 mm across, lateral rays 11–14, central ray 0.4–1 times as long as laterals. *Fruiting calyx* with lobes more than half length of mature fruit, prickles absent or present, 1–2.5 mm long. Mature fruits 2–5 per inflorescence, globular, 13–15 mm diameter, yellowish-green, with a few scattered stellate hairs; mesocarp moist but not juicy; pedicels 16–27 mm long in fruit, 1.2–1.5 mm thick at mid-point; seeds brown to black, 2.9–3.5 mm long. *Silver-leaf Nightshade.*

***Specimens examined*: Queensland.** BURNETT DISTRICT: 1 mile [1.6 km] N of Dappil railway siding, 7 miles [11 km] N of Gayndah, Oct 1966, *Marlowe* (BRI); County of Bowen, near Gayndah, Oct 1973, *James* (BRI). DARLING DOWNS DISTRICT: Elbow Valley, Dec 1959, *Seton* (BRI); 6 miles [10 km] N of Oakey, May 1963, *Inglis* (BRI); 2 miles [3 km] NW of Jandowae, Jan 1966, *Colborn* (BRI); 10.5 miles [17 km] ENE of Dalby, Nov 1971, *Cook* (BRI); Parish of Daadine near Dalby, Oct 1973, *James* (BRI); near Jandowae, Oct 1973, *James* (BRI); between Oakey and Biddeston, Jan 1979, *Kay* (BRI); Oakey, 50–100 m along Bacon's Road, Jan 2000, *Menkins* DDP17 (BRI); Limevale, on Texas–Inglewood road, May 2002, *Halford* Q7531 & *Batianoff* (BRI). MORETON DISTRICT: 3 miles [5 km] SW of Laidley, Feb 1965, *Noffke* (BRI); 3 km E of Laidley, Nov 1973, *James* 5 (BRI); Gatton, Dec 1977, *Olsen s.n.* (BRI); 5 miles [8 km] NNE of Laidley, Feb 1979, *Armstrong* (BRI); Pearsons Road, Kalbar, Mar 2002, *Pocknee s.n.* (BRI). **New South Wales**. Bonshaw, Dec 1976, *Sharp* (BRI).

***Distribution and habitat*:** *Solanum elaeagnifolium* is native to southern U.S.A., Mexico, Argentina and Paraguay. It is sporadically naturalised in south-eastern parts of Queensland (**Map 31**). It occurs commonly in New South Wales, Victoria and South Australia, and sporadically in south-western Western Australia. It is found on degraded sites, such as disused cultivation paddocks, improved pasture and roadsides. Soil type is apparently unimportant, and varies from sandy to clayey types.

***Phenology*:** Flowers have been recorded from October to February; mature fruits in February.

***Notes*:** *S. elaeagnifolium* is close to *S. esuriale*, but differs by the branchlet stellae 0.4–0.5 mm diameter (*vs.* 0.7–0.9 mm for *S. esuriale*) with 15–18 lateral rays (8–12 lateral rays for *S. esuriale*), prickles usually present on pedicels and calyx (absent for *S. esuriale*), calyx stellae with 13–20 lateral rays (*vs.* 6–9 for *S. esuriale*) and anthers 7–9 mm long (*vs.* 3.5–5 mm for *S. esuriale*).

It is remarkable that the American species *S. elaeagnifolium* is so similar to the Australian species *S. esuriale*, to the extent that microscopic examination is often necessary to determine them.

S. elaeagnifolium has been declared a noxious weed for the whole of New South Wales (Conn 1992), but does not appear to be a serious weed in Queensland.

79. Solanum ammophilum A.R.Bean **sp. nov.** Frutex erectus parvus; ramuli aculei sparsi, recti, ad basim lati; ramuli stellae radiis lateralibus 8–13; folia linearia usque anguste lanceolata, pilis type-2 in paginis ambabus; inflorescentia 1 vel 2-flora, floris constanter 4-meris; calycis aculei absentes; ovarium papillis albidis glandularibus praeditum; fructus maturi flavovirentes, biloculares. **Typus:** Queensland. MARANOA DISTRICT: 73 km from Charleville towards Bollon, 28 January 2002, *A.R. Bean* 18423 (holo: BRI (1 sheet + spirit); iso: AD, CANB, DNA, MEL, MO, NSW, *distribuendi*).

Erect, herbaceous resprouter, 0.2–0.4 m high. Juvenile stage absent. Adult branchlets white, grey or yellow; prickles absent or present, 0–10 per decimetre, straight, broad-based, 1.5–5 mm long, 5–7 times longer than wide; stellae dense to very dense, 0.3–0.5 mm diameter, sessile; lateral rays 8–13, porrect; central ray absent or present, 0–0.3 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs dense. *Adult leaves* linear or narrow lanceolate, entire; lamina 2–7 cm long, 0.3–0.7 cm wide, 6–10 times longer than broad, apex obtuse, base cuneate, oblique part 0–1 mm long, obliqueness index 0–3 percent; petioles 0.3–0.8 cm long, 10–17% length of lamina, prickles absent. *Upper leaf surface* grey-green; prickles absent; stellate hairs distributed throughout; protostellae absent; ordinary stellae dense, 0.1–0.2 mm apart, 0.2–0.5 mm across, sessile; lateral rays 8–10, porrect; central ray 0–0.3 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs present throughout, 0.1–0.2 mm apart. *Lower leaf surface* white; prickles absent; stellae dense to very dense, 0.05–0.1 mm apart, 0.4–0.8 mm diameter, stalks 0–0.1 mm long; lateral rays 8–10, porrect; central ray 0–0.3 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs present throughout, 0.05–0.1 mm apart. *Inflorescence* leaf-opposed or supra-axillary, solitary or pseudo-racemose, common peduncle absent, rachis prickles absent; 1 or 2-flowered, with all flowers bisexual and 4-merous; pedicels 5–17 mm long at anthesis, same thickness throughout, 0.8–1.1 mm thick at mid-point, prickles absent. Calyx tube 2.5–4 mm long, lobes deltate, 2.5–6 mm long; prickles absent at anthesis; stellae very dense, white, 0.4–0.6 mm across, stalks 0–0.1 mm long, lateral rays 8–11, central ray 0.2–0.8 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. Corolla purple, 7–15 mm long, deeply lobed, inner surface glabrous; anthers 4.5–7.5 mm long; ovary with white glandular papillae; functional style 8–11.5 mm long, erect, with white glandular papillae. *Fruiting calyx* with lobes less than or more than half length of mature fruit, prickles absent. Mature fruits 1 or 2 per inflorescence, oblate or globular, *c.* 13 mm diameter, yellowish-green, 2-locular; placenta in cross-section sessile, elliptical; mesocarp moist but not juicy; exocarp 0.7–0.9 mm thick; pedicels 9–18 mm long in fruit, 0.8–1.1 mm thick at mid-point; seeds pale yellow, 2.8–3 mm long. **Fig. 42.**

***Specimens examined*: Queensland.** WARREGO DISTRICT: 'Gilruth Plains', E of Cunnamulla, May 1939, *Blake* 14062 (BRI); 'Glenbar', *c.* 42 [miles?] SE of Charleville, Apr 1948, *Everist* 3395 (BRI, CANB); 'Gilruth Plains', Apr 1963, *McKee* 10366 (BRI); 22 miles [35 km] E of Cunnamulla on road to Bollon, Sep 1963, *Phillips* 534 (BRI); Top Cane paddock, 'Gilruth Plains', Cunnamulla, Apr 1967, *Barker* 784 (CANB). MARANOA DISTRICT: 'Dingwall', *c.* 90 miles [145 km] SSE of Charleville, Jul 1948, *Everist* 3483 (BRI); 'Calabah', 75 miles [121 km] SE of Charleville, Mar 1962, *Ebersohn* (BRI); *c.* 21 km W of Boatman road, ENE of Cunnamulla, Dec 1998, *Bean* 14485 (BRI, MEL); 73 km from Charleville towards Bollon, Jan 2002, *Bean* 18426 (AD, BRI, CANB); 70 km from Charleville towards Bollon, Jan 2002, *Bean* 18434 (BRI, MEL); 64 km from Charleville towards Bollon, Jan 2002, *Bean* 18440 (BRI). **New South Wales.** NORTH WEST PLAINS: Bourke district, Jan 1951, *Darley* 15 (NSW); 'Widgee Downs', Weilmoringle, Jun 1967, *Jensen* B6 (NSW); 32 miles [52 km] N of Bourke on Mitchell Highway, Apr 1977, *Moore* 7502 (CANB); 'Lila Springs', *c.* 25 km SSE of Enngonia, Feb 1978, *Barker* 424 (NSW).

***Distribution and habitat*:** *Solanum ammophilum* is found in the Charleville and Cunnamulla districts of Queensland (**Map 27**), and near Bourke in New South Wales. It inhabits low open woodland with *Eucalyptus melanophloia*, and often with *Acacia aneura, Angophora melanoxylon, E. populnea, Triodia* sp. on yellow to red sandy soils, often adjacent to shrubland areas featuring *Grevillea juncifolia*.

***Phenology*:** Flowers are recorded from September to May; mature fruits from January to July.

***Notes*:** *S. ammophilum* is close to *S. coactiliferum*, but differs by the leaves 6–10 times longer than wide (4–6 times for *S. coactiliferum*); branchlet stellae with 8–13 lateral rays; leaf stellae with 8–10 lateral rays (*vs.* 7 or 8 lateral rays for *S. coactiliferum*); stellae stalks <0.1 mm long (*vs.* 0.1–0.2 mm long for *S. coactiliferum*); the corolla glabrous on the inner surface (stellate-hairy for *S. coactiliferum*), and the presence of Type 2 hairs on the lower leaf surface.

The glandular papillae on the ovary and lower half of style are unique among Queensland species. These papillae persist on the fruits, and give them a distinctly sticky texture.

***Conservation status*:** Moderately widespread. Not considered at risk.

***Etymology*:** from the Greek *ammo-* (of the

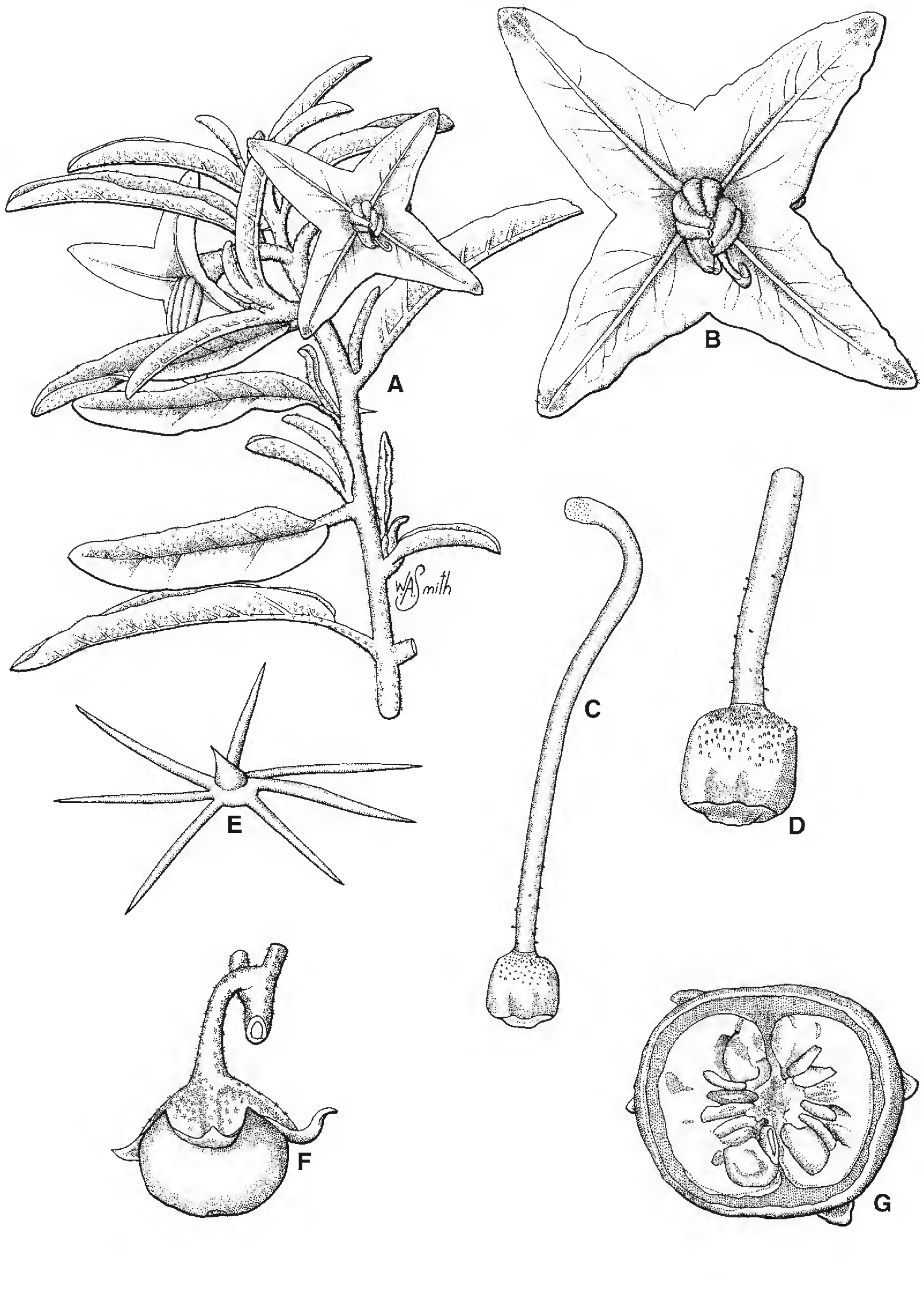


Fig. 42. ***Solanum ammophilum***. A. flowering branchlet × 1.5. B. flower × 3. C. ovary and style × 6. D. ovary, bearing glandular papillae × 12. E. stellate hair, upper leaf surface × 100. F. mature fruit, calyx and pedicel × 2. G. transverse section of fruit × 3. all from *Bean* 18423.

sand) and *-philus* (loving). This species occurs on soils that are much sandier than the prevalent soil type in the area.

80. Solanum sturtianum F.Muell., Trans. Philos. Soc. Victoria 1: 18–19 (1854); Hook. J. Bot. & Kew Gard. Misc. 8: 166 (1856). **Type:** interior of South Australia, 1844–46, *C. Sturt* No. 87 (lecto: MEL [MEL 11651]), here chosen.

***Illustrations*:** Cunningham *et al.* (1981: 589); Symon (1981: 205); P.S. Green, Curtis's Botanical Magazine 177: t. 543 (1969).

Erect, rhizomatous perennial shrub, 0.3–1.5 m high. Juvenile stage unknown. Adult branchlets white or grey; prickles absent or present, 0–10 per decimetre, straight, broad-based, 2–4 mm long, 5–7 times longer than wide; stellae very dense, 0.3–0.5 mm diameter, sessile; lateral rays 12–16, porrect; central ray absent; finger hairs absent; Type 2 hairs absent. *Adult leaves* lanceolate, entire; lamina 4.5–7 cm long, 1–1.8 cm wide, 3.8–5.7 times longer than broad, apex obtuse or acute, base cuneate or obtuse, oblique part 0–3 mm long, obliqueness index 0–6 percent; petioles 0.6–1.3 cm long, 15–25% length of lamina, prickles absent or present. *Upper leaf surface* grey-green or grey; prickles absent; stellate hairs distributed throughout; protostellae absent; ordinary stellae density moderate to dense, 0.1–0.2 mm apart, 0.15–0.3 mm across, sessile; lateral rays 13–15, porrect; central ray absent; finger hairs absent; Type 2 hairs absent. *Lower leaf surface* white or yellowish; prickles absent; stellae very dense, 0.05–0.1 mm apart, 0.2–0.3 mm diameter, sessile; lateral rays 13–16, porrect; central ray absent; finger hairs absent; Type 2 hairs absent. *Inflorescence* supra-axillary, pseudo-racemose, common peduncle 3–5 mm long, rachis prickles absent; 5–7-flowered, strongly or weakly andromonoecious, flowers 5-merous; pedicels 4–8 mm long at anthesis, same thickness throughout, 0.5–0.8 mm thick at mid-point, prickles absent. Calyx tube 1.5–3 mm long, lobes deltate, 1.5–2.5 mm long; prickles absent at anthesis; stellae very dense, yellow or white, 0.15–0.25 mm across, sessile, lateral rays 12–15, central ray absent; finger hairs absent; Type 2 hairs absent. Corolla mauve or purple, 8–10 mm long, shallowly lobed, inner surface glabrous; anthers 4.5–5.5 mm long; ovary with stellate and Type 2 hairs; functional style 7–8 mm long, erect, with stellate and Type 2 hairs, stellae 0.15–0.2 mm across, lateral rays 6–13, central ray 1–1.5 times as long as laterals. *Fruiting calyx* with lobes less than half length of mature fruit, prickles absent. Mature fruits 1–3 per inflorescence, globular, 9–13 mm diameter, brown or yellow; mesocarp dry; pedicels 7–12 mm long in fruit, 0.8–1 mm thick at mid-point; seeds brown to black, 4–5.1 mm long. *Thargomindah nightshade.* **Fig. 8.**

***Specimens examined*:** **Queensland.** GREGORY SOUTH DISTRICT: South Galway, Jun 1949, *Everist* 4042 (BRI); *c.* 61 km W of Eromanga, Sep 1989, *Wilson* 437 & *Pickering* (AD, BRI, MO, NSW); 76.5 km from Thargomindah, Sep 1990, *Zalucki* (BRI); W of Eromanga, Aug 1997, *Anderson* 5070 (BRI). WARREGO DISTRICT: Thargomindah, Sep 1896, *Maiden* (BRI, NSW); 5 miles [8 km] S of Thargomindah, May 1910, *Little* (BRI); Norley Station [c. 25 km NNE of Thargomindah], May 1919, *Watts* (BRI); 'Thargomindah' Station, Oct 1950, *Grummit* (BRI); 19 km S of Thagomindah, Nov 1954, *Smith* 6055 (BRI); Thargomindah–Hungerford Stock Route, Feb 1965, *Carr* (BRI); *c.* 11 km SW of Thargomindah, on road to Hungerford, Sep 1973, *Henderson* H2060 & *Boyland* (AD, BRI, SP, US); Grey Range, *c.* 74 km from Thargomindah on road to Noccundra, Jul 1977, *Purdie* 735 (BRI); 12 km W of Thargomindah, May 1978, *Olsen* 760 & *Boyland* (BRI); 27.1 km W of Pinidary turnoff, on Thargomindah–Nockatunga road, Sep 1990, *Prendergast* HDP341 (BRI). **New South Wales.** NORTH FAR WESTERN PLAINS: 78.1 km from 'Olive Downs' HS via Jump-up Loop road, ENE of Tibooburra, Sep 1989, *Coveny* 13583 *et al.* (AD, BRI, MO, NSW).

***Distribution and habitat*:** In Queensland, *Solanum sturtianum* is confined to the far south western parts, especially around Thargomindah (**Map 26**). It also occurs widely in arid parts of New South Wales, South Australia, Western Australia and Northern Territory. It grows on plains or stony ridges, in chenopod shrubland or *Acacia* open woodland. Associated species include *Acacia aneura, A. cambagei* and *Senna* spp.

***Phenology*:** Flowers are recorded from June to October; mature fruits from May to November, plus a single record from February.

***Notes*:** Brown (1849) stated that Captain Sturt "placed at my disposal the collection of plants formed in his recent expedition ....", and this explains the presence of a syntype at BM. Brown (*loc. cit.*) named numerous new species from this collection, but decided not to name several species that he considered were probably new due to “the incomplete state of the specimens”. Presumably *Solanum sturtianum* was one of these. Mueller named *S. sturtianum* in 1854.

Symon (1981) chose the specimen residing in BM as the lectotype of *S. sturtianum*, “in view of the quality of the specimen”. Mueller never visited England, nor did he borrow specimens from BM. Since Mueller could never have seen the BM specimen, it cannot be considered in the choice of the lectotype. I therefore overturn Symon’s lectotypification, which is contrary to Article 9.10 (Greuter *et al.* 2000), and choose instead MEL 11651 as lectotype.

***Conservation status*:** Widespread. Not considered at risk.

81. Solanum oligacanthum F.Muell., Trans. Philos. Soc. Victoria 1: 18–19 (1854). **Type:** Central Australia, 1844–46, *C. Sturt* (holo: MEL [MEL11991]).

***Illustrations*:** Cunningham *et al.* (1981: 591); Symon (1981: 207).

Erect, herbaceous resprouter or rhizomatous perennial shrub, 0.2–0.6 m high. Juvenile stage unknown. Adult branchlets white or grey; prickles absent or present, 0–30 per decimetre, straight, acicular, 0.5–13 mm long, 8–11 times longer than wide; stellae very dense, 0.2–0.4 mm diameter, stalks 0–0.1 mm long; lateral rays 13–15, porrect or multiradiate; central ray absent or present, 0–0.7 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Adult leaves* broadly ovate or orbicular, entire; lamina 1–2.5 cm long, 0.9–2.8 cm wide, 0.8–1.4 times longer than broad, apex obtuse, base obtuse or cordate, oblique part 0–1 mm long, obliqueness index 0–6 percent; petioles 0.1–0.3 cm long, 6–18% length of lamina, prickles absent. *Upper leaf surface* green to grey; prickles 0–2, straight, acicular, 1–7 mm long, prickles absent or present on midvein only; stellate hairs distributed throughout; protostellae absent; ordinary stellae density moderate to dense, 0.1–0.25 mm apart, 0.15–0.3 mm across, sessile; lateral rays 12–16, porrect or multiradiate; central ray 0.1–0.5 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Lower leaf surface* white; prickles absent; stellae very dense, *c.* 0.05 mm apart, 0.2–0.35 mm diameter, sessile; lateral rays 9–18, porrect or multiradiate; central ray 0.3–0.8 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Inflorescence* supra-axillary, pseudo-racemose, common peduncle 0–4 mm long, rachis prickles absent or present; 4–6-flowered, flowers 5-merous; pedicels 2.5–7 mm long at anthesis, same thickness throughout, 0.5–0.8 mm thick at mid-point, prickles absent. Calyx tube 2–3 mm long, lobes deltate, 2.5–3.5 mm long; prickles absent at anthesis; stellae very dense, yellow or white, 0.3–0.4 mm across, stalks 0–0.2 mm long, lateral rays 10–16, central ray 0.7–1.3 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. Corolla purple, 8–11 mm long, rotate, inner surface glabrous; anthers 3.5–5.5 mm long; ovary with Type 2 hairs only; functional style 7–8 mm long, erect, with Type 2 hairs only. *Fruiting calyx* with lobes less than half length of mature fruit, prickles absent. Mature fruits 1–6 per inflorescence, globular, 8–11 mm diameter, brown or yellow; mesocarp moist but not juicy; pedicels 3–8 mm long in fruit, 0.6–0.9 mm thick at mid-point; seeds brown to black, 3.6–5.3 mm long.

***Specimens examined*:** **Queensland.** GREGORY SOUTH DISTRICT: Cuppa Creek, 12 miles [19 km] W of Durrie, Jan 1937, *Everist & Smith* 82 (BRI); N of Betoota, Aug 1953, *Davidson* 433 (BRI); ‘Tanbar’ Station, W of Cooper’s Creek, Feb 1968, *Lewis* (CANB); east of Simpson Desert, Jul–Aug 1969, *Cockburn* BPS3 (BRI); 8 km from Birdsville on new Betoota road, Sep 1977, *Purdie* 1139 (BRI); NW edge of Lake Yamma Yamma, Mar 1990, *Sandercoe* 4065 (BRI); 50 km W of Birdsville, on track to Poeppel Corner, Sep 1998, *Halford* Q3651 (BRI). WARREGO DISTRICT: 38 miles [61 km] S of Thargomindah, Feb 1968, *Lewis* (CANB). **New South Wales.** NORTH FAR WESTERN PLAINS: Ford Grey Basin, *c.* 100 km NW of Tibooburra, May 1980, *Paijmans* 3456 (CANB); S edge of Lake Pinaroo near Fort Grey camping area, Sturt N.P., Sep 1989, *Coveny* 13475 *et al.* (AD, BRI, MO, NSW).

***Distribution and habitat*:** In Queensland, *Solanum oligacanthum* is confined to the extreme south-west of the state, near Birdsville (**Map 28**). It is also found in adjacent areas of New South Wales and South Australia. It grows in shrubland, on creek channels, claypans, lake margins and interdunal flats. Soils may be sandy or clayey.

***Phenology*:** Flowers are recorded for January, March, July, August and September; mature fruits in January and September.

***Notes*:** *S. oligacanthum* is immediately recognisable by its adult leaves. They are entire, orbicular or broadly ovate, and less than 25 mm long. *S. orbiculatum* from the Northern Territory and Western Australia also has orbicular or broadly ovate leaves, but they are larger. It also has longer petioles and larger fruits.

***Conservation status*:** Widespread. Not considered at risk.

Group 27F (S. echinatum group), here defined; related to Group 27 (*S. ellipticum* group) of Whalen (1984).

Adult leaves entire to shallowly-lobed (100%); fruiting calyx prickly, accrescent, covering the fruit completely (100%); habit prostrate or procumbent (100%); ovary glabrous (100%); mature fruits brown, oblate, 4-locular (100%); common peduncle >25 mm long (100%); corolla rotate, inner surface glabrous (100%); seeds brown to black (100%).

3 species endemic to Australia; 2 species indigenous to Queensland.

82. Solanum echinatum R.Br., Prodr. 447 (1810). **Type:** [Northern Territory.] North Island, Sir Edward Pellew Group, 16 December 1802, *R. Brown* (holo: BM; iso: MEL [MEL 12416]).

Solanum seitheae Symon, J. Adelaide Bot. Gard. 4: 201 (1981), **syn. nov. Type:** Queensland. Burke District: 116 km SW of Normanton, top of Donors Hills, 29 May 1967, *D.E. Symon* (holo: AD; iso: BRI, CANB, K, NSW).

***Illustrations*:** Symon (1981: 197); Symon (1981: 203), as *S. seitheae.*

Prostrate, rhizomatous perennial shrub, 0.1–0.3 m high. Juvenile stage unknown. Adult branchlets yellow, rusty or brown; prickles 200–660 per decimetre, straight, acicular, 1–8 mm long, 10–20 times longer than wide; stellae very dense, 0.6–0.8 mm diameter, stalks 0–0.8 mm long; lateral rays 7 or 8, porrect; central ray 0.8–1.8 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Adult leaves* ovate, entire or shallowly lobed throughout; lobes 3 or 4 on each side, obtuse, lobing index 1–1.1; lamina 3.5–9.5 cm long, 2–5.5 cm wide, 1.7–2 times longer than broad, apex acute, base obtuse or cordate, oblique part 0–3.5 mm long, obliqueness index 0–9 percent; petioles 1.1–5 cm long, 25–55% length of lamina, prickles present. *Upper leaf surface* grey-green; prickles 0–12, straight, acicular, 3–5 mm long, prickles absent or present on midvein only or present on midvein and lateral veins; stellate hairs distributed throughout; protostellae absent; ordinary stellae density moderate to dense, 0.1–0.4 mm apart, 0.4–0.8 mm across, stalks 0–0.2 mm long; lateral rays 7–9, porrect; central ray 1–1.5 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Lower leaf surface* white or yellowish; prickles 0–9, straight, acicular, absent or present on midvein only or present on midvein and lateral veins; stellae dense to very dense, 0.05–0.1 mm apart, 0.6–0.9 mm diameter, stalks 0–0.2 mm long; lateral rays 7 or 8, porrect; central ray 1–1.5 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Inflorescence* supra-axillary, pseudo-racemose, common peduncle 25–38 mm long, rachis prickles present; 2–5-flowered, with all flowers bisexual and 5-merous; pedicels 3–9 mm long at anthesis, same thickness throughout or markedly thicker distally, 1–1.2 mm thick at mid-point, prickles present. Calyx tube 3–6 mm long, lobes rostrate or attenuate, 3–6 mm long; prickles present at anthesis, 60–300 per flower, 1–3 mm long; stellae very dense, yellow, brown or rusty, 0.7–0.9 mm across, stalks 0–1.1 mm long, lateral rays 7 or 8, central ray 1–1.8 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. Corolla mauve or purple, 9–14 mm long, rotate, inner surface glabrous; anthers 4.5–6 mm long; ovary glabrous; functional style 7–7.5 mm long, erect, glabrous. *Fruiting calyx* tube accrescent, enclosing most or all of mature fruit, prickles 1–8 mm long. Mature fruits 1–4 per inflorescence, oblate, 15–20 mm diameter, brown, 4-locular; placenta in cross-section stalked, anvil-shaped; mesocarp moist but not juicy; exocarp 2–2.3 mm thick; pedicels 10–18 mm long in fruit, 1–1.8 mm thick at mid-point; seeds brown to black, 2–2.3 mm long. **Fig. 9.**

***Specimens examined*: Queensland.** Burke District: Leichhardt River, Jun 1935, *Blake* 9292 (BRI); 'Adels Grove', via Camooweal, Mar 1947, *De Lestang* 347 (BRI); 9 miles [14 km] W of 'Riversleigh' Station, Jun 1948, *Perry* 1440 (BRI, CANB); Calton Hills, 45 miles [72 km] N of Mt Isa, May 1963, *Gittins* 762 (BRI); 1 mile [1.6 km] E of 'Wernadinga', May 1967, *Symon* 4995 (AD, BRI, CANB, K); 17 miles [27 km] W of Nicholson River crossing, Jun 1967, *Symon* 5017 (AD, BRI); 14 km from Gunpowder on Quamby road, Oct 1972, *Althofer* 288 (BRI); 60 km E of Mt Isa on Mt Isa–Cloncurry road, Aug 1973, *Swan* 117 (BRI); *c.* 8 miles [13 km] NW of 'Riversleigh' station on road to 'Lawn Hill', Jul 1974, *Ollerenshaw* 1317 & *Kratzing* (BRI, CANB); Burketown, *c.* 24 km on Doomadgee Road, Jul 1974, *Ollerenshaw* 1354 & *Kratzing* (BRI, CANB); 120 km W of Mt Isa, Jul 1974, *Swan* 94 (BRI); 60 miles [97 km] NE of Mt Isa on road to Julius Dam, Aug 1974, *Swan* 126 (BRI, CANB); Dugald River Lode in vicinity of One Tree Hill, NW of Quamby, May 1976, *Simon* 3010 & *Farrell* (BRI); 24 km N of Mt Isa, Dec 1986, *Harris* 107 (BRI); W side of Lake Moondarra, 16 km NE of Mt Isa, Dec 1989, *Harris* 432 (BRI); 0.7 km NW of Magazine Hill, 10 km N of Silver Star Mine, Apr 1991, *Jones* 403A (BRI); Musselbrook Gorge, Lawn Hill N.P., Jul 1992, *McDonald* KM1117 & *Johnson* (BRI); main highway 109 km from Normanton, 88 km from Burke and Wills Roadhouse, Jul 1993, *Alcock* 11285 (AD, BRI); bank of Nicholson River, near Kingfisher Camp, Apr 1996, *Milson* JM1108 (BRI); Hilton shaft, Mt Isa shire, Jun 1996, *Barrs* SB28 (BRI); Lawn Hill, plateau above canoe portage area, Jul 1998, *Symon* 15791 (AD, BRI, L, NY).

***Distribution and habitat*:** *Solanum echinatum* is found in the northwestern corner of Queensland, as far south as Mt Isa (**Map 28**). It is also common in the Northern Territory, including the islands of the Gulf of Carpentaria. It grows on stony ridges or gullies in low eucalypt woodland, on a variety of substrates, including laterite.

***Phenology*:** Flowers are recorded from April to August, with a single record in December. Fruits are recorded from March to August.

***Notes*:** Closely related to *S. longissimum*, see Notes under that species. Both *S. echinatum* and *S. longissimum* have numerous conspicuously stalked stellae, especially on the branchlets and rachis, but also to a lesser degree on the upper and lower leaf surfaces (**Fig. 9**). The calyx prickles are extremely numerous, and there are always some smaller prickles with stellae mounted at the top (or, from the other perspective, long-stipitate stellae which are becoming prickles) (**Fig. 4**). By contrast, the stellae of *S. senticosum* (which grows in the same area) have stalks all about the same length with none conspicuously long. Also, none of the calyx prickles of *S. senticosum* have stellae mounted at the top. Hence *S. echinatum* and *S. longissimum* can be readily separated from *S. senticosum* in the absence of fruiting material.

The type of *S. seitheae* is indistinguishable from the type of *S. echinatum*. They both have fruits of about the same size, a dense rusty tomentum, some leaves with shallow lobes, and petioles less than half as long as the lamina.

There are additional unnamed taxa related to *S. echinatum* in the Northern Territory, and *S. wilkinsii* S.Moore probably deserves to be reinstated.

***Conservation status*:** Widespread. Not considered at risk.

83. Solanum longissimum A.R.Bean **sp. nov.** Frutex prostratus vel procumbens; ramuli aculeis 3–80 per decimetrum; folia adulta ovata usque late ovata, integra, petiolis longitudine 67–116% laminae; inflorescentia pseudo-racemosa, pedunculo communi 35–67 mm longo; calycis aculei saepe non manifesti sub anthesi; corolla rotata; ovarium glabrum; calyx fructifer densissime aculeatus, accrescens, fructum includens; fructus maturi oblati, brunnei, pedicellis 20–30 mm longis. **Typus:** Queensland. Cook District: Pannikan Springs area, 29 km W of Mungana, 26 January 1993, *A.R. Bean* 5617 & *P.I. Forster* (holo: BRI; iso: DNA).

Prostrate, rhizomatous perennial shrub, 0.15–0.3 m high. Juvenile stage unknown. Adult branchlets rusty or brown; prickles 3–80 per decimetre, straight, acicular or broad-based, 1–5 mm long, 6–10 times longer than wide; stellae dense, 0.6–1.1 mm diameter, stalks 0–0.6 mm long; lateral rays 7 or 8, porrect; central ray 1–1.8 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Adult leaves* ovate or broadly ovate, entire; lamina 3–8 cm long, 1.7–4 cm wide, 1.6–2.1 times longer than broad, apex acute, base cuneate or obtuse, oblique part 0–5 mm long, obliqueness index 0–12 percent; petioles 2.4–5.5 cm long, 65–115% length of lamina, prickles absent. *Upper leaf surface* green or grey-green; prickles absent; stellate hairs distributed throughout; protostellae absent; ordinary stellae sparse to dense, 0.25–0.5 mm apart, 0.6–0.7 mm across, stalks 0–0.1 mm long; lateral rays 6–8, porrect; central ray 1–1.8 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Lower leaf surface* yellowish; prickles absent; stellae dense, 0.15–0.3 mm apart, 0.6–0.8 mm diameter, stalks 0–0.2 mm long; lateral rays 7 or 8, porrect; central ray 0.8–1.5 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Inflorescence* supra-axillary, pseudo-racemose, common peduncle 35–67 mm long, rachis prickles present; 3 or 4-flowered, flowers 5-merous; pedicels 4–6 mm long at anthesis, same thickness throughout or markedly thicker distally, 0.5–0.9 mm thick at mid-point, prickles present. Calyx tube 2.5–3.5 mm long, lobes deltate, 1–2.5 mm long; prickles absent or present at anthesis, zero or 20–100 per flower, 1–1.5 mm long; stellae very dense, yellow, 0.5–0.9 mm across, stalks 0–1.5 mm long, lateral rays 5–8, central ray 1–1.8 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. Corolla purple, 7–10 mm long, rotate, inner surface glabrous; anthers 3.5–4.5 mm long; ovary glabrous; functional style 6–6.5 mm long, erect, glabrous. *Fruiting calyx* tube accrescent, enclosing most or all of mature fruit, prickles 1–5 mm long. Mature fruits 1 or 2 per inflorescence, oblate, brown; mesocarp moist but not juicy; pedicels 20–30 mm long in fruit, 0.9–1.2 mm thick at mid-point. **Fig. 4, 43.**

***Specimens examined*: Northern Territory.** Nicholson River area, Tin Hole Creek, Jun 1974, *Maconochie* 2025 (BRI, CANB, DNA); 4 km W of 'Newcastle Waters', Feb 1980, *Latz* 8335 (BRI, DNA). **Queensland.** BURKE DISTRICT: 16 km (by road) W of Musselbrook Mining Camp on road to Border Waterhole, Apr 1995, *Thomas* MRS179 & *Johnson* (AD, BRI). COOK DISTRICT: Gugu Yalungi Main Camp, Laura, Mar 1975, *Hyland* 8089 (BRI, CANB, QRS).

***Distribution and habitat*:** *Solanum longissimum* has a scattered distribution across northern Queensland (**Map 31**) and adjacent areas of the Northern Territory. It is recorded from sandstone ridges or lateritic rises supporting low eucalypt woodland with spinifex (*Triodia* spp.) in the understorey.

***Phenology*:** Flowers are recorded for January, February, March and June. Fruits are recorded for April.

***Notes*:** Related to *S. echinatum*, but differing by the sparsely prickly branchlets with 3–80 prickles per dm (*vs.* 200–660 for *S. echinatum*); branchlet prickles 6–10 times longer than wide (10–20 times for *S. echinatum*); the dense stellate hairs on the branchlets (*vs.* very dense for *S. echinatum*); the very long petioles, 65–115% of lamina length (*vs.* 25–55% for *S. echinatum*); and the deltate calyx lobes 1–2.5 mm long (*vs.* rostrate to attenuate, 3–6 mm long for *S. echinatum*).

***Conservation status*:** Data deficient.

***Etymology*:** From the Latin *longissimus* meaning 'longest', in reference to the exceptionally long petioles of this species, sometimes exceeding the lamina in length.

Group 28 (S. dioicum group) of Whalen (1984)

One bisexual flower per inflorescence (100%); male flowers smaller and less prickly than bisexual flowers (100%); mature fruits large, 23–30 mm diameter, green to yellowish-green (100%); fruiting calyx prickly, accrescent (100%); corolla rotate (100%); upper and lower leaf surfaces with dense to very dense indumentum (100%); seeds brown to black (100%); stigma of bisexual flower forked (50%).

18 species endemic to Australia; 2 species indigenous to Queensland.

84. Solanum chippendalei Symon, J. Adelaide Bot. Gard. 4: 272 (1981). **Type:** Western Australia. base of the Sir Frederick Range, 1 August 1962, *D.E. Symon* 2272 (holo: AD; iso: AD, CANB, PERTH).

Illustration: Symon (1981: 273)

Erect, rhizomatous perennial shrub, 0.4–1 m high. Juvenile stage unknown. Adult branchlets terete or ridged, white; prickles 35–400 per decimetre, straight, acicular, 1–9 mm long, 7–11 times longer than wide; stellae very dense, 0.8–1.3 mm diameter, stalks 0–1.2 mm long; lateral rays 7 or 8, porrect or ascending; central ray present, 1–1.5 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Adult leaves* lanceolate, elliptical or ovate, shallowly to deeply lobed throughout, rarely entire; lobes 2–4 on each side, obtuse, lobing index 1–5; lamina 4–9.5 cm long, 1.4–3.7 cm wide, 1.6–3.5 times longer than

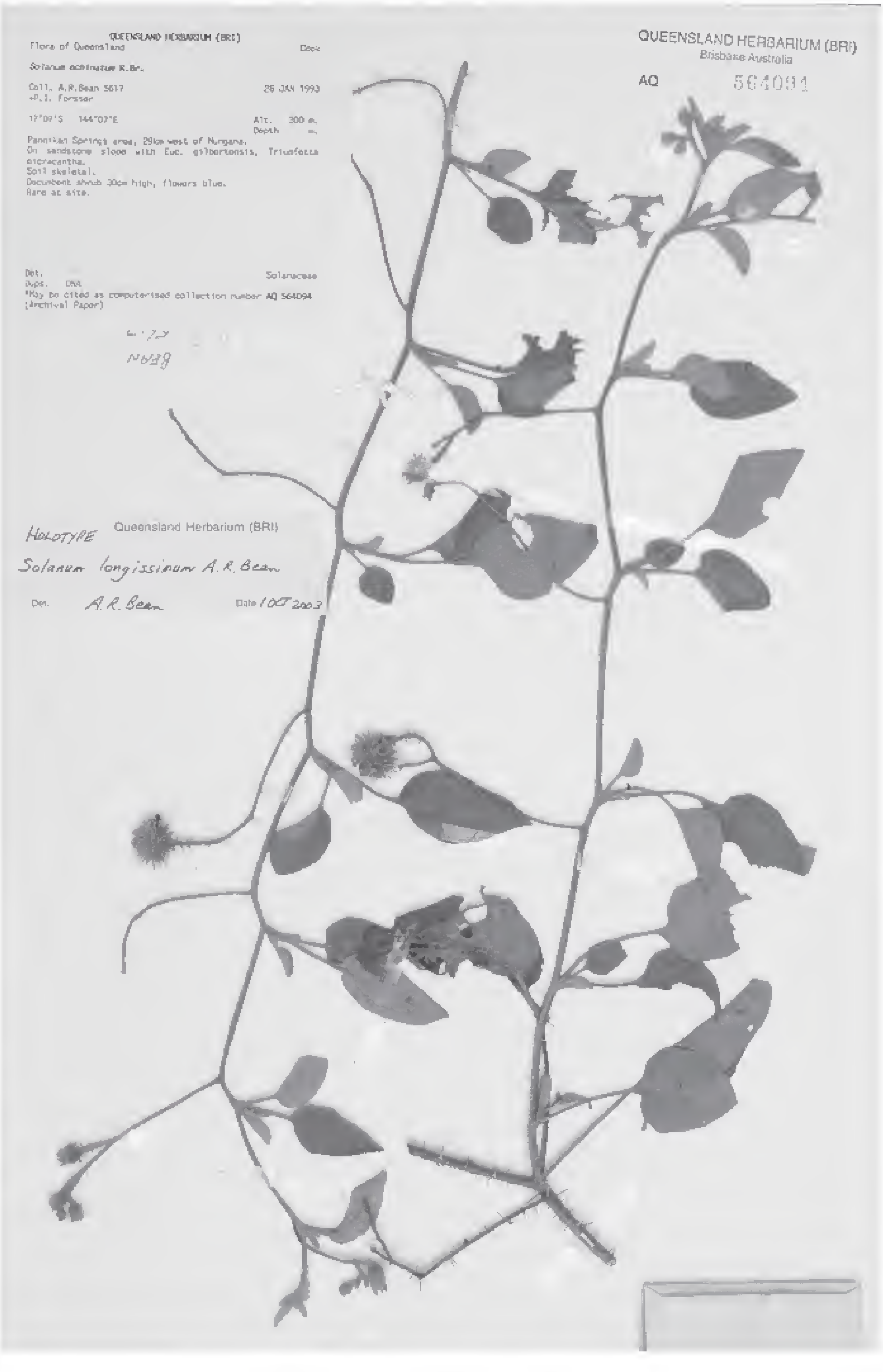

QUEENSLAND HERBARIUM (BRI)
Flora of Queensland
Dock
Solanum echinatum R.Br.
Coll. A.R.Bean 5617
+P.I. Forster
26 JAN 1993
17°07'S 144°07'E
Alt. 300 m.
Depth m.
Pannikan Springs area, 29km west of Mungana.
On sandstone slope with Euc. gilbertensis, Triumfetta micracantha.
Soil skeletal.
Decumbent shrub 30cm high, flowers blue.
Rare at site.
Det.
Solanaceae
Dups. DNA
*May be cited as computerised collection number AQ 564094
(Archival Paper)
6-'73
N039
QUEENSLAND HERBARIUM (BRI)
Brisbane Australia
AQ 564094
HOLOTYPE
Queensland Herbarium (BRI)
Solanum longissimum A.R.Bean
Det. A.R. Bean
Date 1 OCT 2003

Fig. 43. Holotype of ***Solanum longissimum***.

broad, apex obtuse or acute, base cuneate or obtuse, oblique part 0–5 mm long, obliqueness index 0–8 percent; petioles 0.8–2.1 cm long, 20–30% length of lamina, prickles present. *Upper leaf surface* grey-green or grey; prickles 0–8, straight, acicular or broad-based, 3–10 mm long, prickles absent or present on midvein only or present on midvein and lateral veins; stellate hairs distributed throughout; protostellae absent; ordinary stellae dense, 0.15–0.3 mm apart, 0.7–1 mm across, stalks 0–0.2 mm long; lateral rays 6–9, porrect or ascending; central ray 1–2.5 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Lower leaf surface* white or yellowish; prickles 0–5, straight, acicular or broad-based, prickles absent or present on midvein only or present on midvein and lateral veins; stellae dense to very dense, 0.1–0.2 mm apart, 0.8–1.2 mm diameter, stalks 0–0.5 mm long; lateral rays 6–8, porrect; central ray 1–1.8 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Inflorescence* supra-axillary, pseudo-racemose, common peduncle 0–3 mm long, rachis prickles present; 7–11-flowered, strongly andromonoecious, flowers 5-merous. Flowers markedly dimorphic, with larger pricklier basal flower(s); pedicels 5–23 mm long at anthesis, same thickness throughout, 0.7–1.3 mm thick at mid-point, prickles absent or present. Calyx prickles on basal bisexual flowers 40–125, 2–6 mm long; prickles on distal male flowers 0–15, 1–3 mm long. Calyx tube 3–5 mm long, lobes attenuate, 6.5–11 mm long; stellae very dense, white, 0.7–0.9 mm across, stalks 0–1.5 mm long, lateral rays 7 or 8, central ray 1–1.5 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. Corolla purple, 10–20 mm long, rotate, inner surface glabrous; anthers 4–6.5 mm long; ovary glabrous; functional style 10–12.5 mm long, erect, glabrous. *Fruiting calyx* with lobes more than half length of mature fruit, prickles 2–6 mm long. Mature fruits 1 per inflorescence, globular, 23–30 mm diameter, yellowish-green or green; mesocarp moist but not juicy; pedicels 23–48 mm long in fruit, 1.3–2.2 mm thick at mid-point; seeds brown to black, 3.3–3.6 mm long.

***Selected specimens examined*:** **Queensland.** Burke District: Leichhardt River, Apr 1935, *Blake* 8722 (BRI); 2 miles [3 km] N of Selwyn, May 1963, *Gittins* 716 (BRI); 1.6 km E of Mary Kathleen on road to Cloncurry, Apr 1974, *Hockings* 49 (BRI); 1.6 km S of Mt Isa on Urandangi road, Jul 1974, *Kratzing & Ollerenshaw* 1148 (BRI, CANB); 21.2 km N of Wills River on the Duchess–Mt Isa road, Sep 1990, *Wilson* 639 & *Rowe* (AD, BRI, NSW); *c.* 8 km along road to Lady Loretta Mine, turnoff *c.* 65 km from Mt Isa, Aug 1993, *Lally* 101 (BRI, CANB, DNA); 16 km (by road) W of Musselbrook Mining camp on road to Border Waterhole, 175 km N of Camooweal, Apr 1995, *Thomas* MRS174 & *Johnson* (BRI); 106 km N of Dajarra on Mt Isa road, May 1997, *Forster* PIF21159 & *Booth* (BRI, DNA); Barkly Highway, 52 km NW of Mt Isa, Jul 1998, *Symon* 15787 (AD, BRI, L); Spring Creek, NW of Mt Isa, Apr 2001, *McDonald* KRM827 (AD, BRI). Gregory North District: between Dajarra and Duchess, Jun 1978, *Althofer* 8350 (BRI); 15 km NE of 'Burnham', Jun 1979, *Purdie* 1551 (BRI); Boulia–Winton road, 112 km E of Middleton, Jul 1981, *Williams* 81188 (BRI).

***Distribution and habitat*:** In Queensland, *Solanum chippendalei* is confined to the north-west between Winton and Lawn Hill (**Map 30**). It is also widely distributed in semi-arid parts of Northern Territory and Western Australia. It grows commonly in low open eucalypt woodland with Spinifex (*Triodia* spp.) in the understorey, on a variety of substrates. It has also been recorded from alluvium in association with *Eucalyptus camaldulensis*.

***Phenology*:** Flowers are recorded between January and October; fruits between February and October.

Notes: In this species, the basal flower of each inflorescence is larger and pricklier than all other flowers, and only the basal flower develops into a fruit. It is closely allied to *S. melanospermum* F.Muell., a species of restricted occurrence in the Northern Territory.

***Conservation status*:** Widespread. Not considered at risk.

85. Solanum carduiforme F.Muell., Fragm. 2: 163 (1861). **Type:** [Queensland. Burke District:] Gulf of Carpentaria, Nicholson River, 21 August 1856, *F. Mueller* (lecto: K; isolecto: MEL), *fide* Symon (1981).

***Illustration*:** Symon (1981: 301)

Erect, rhizomatous perennial shrub, 0.5–1 m high. Juvenile stage unknown. Adult branchlets terete or ridged, white, grey or rusty; prickles 140–600 per decimetre, straight, acicular, 1–11 mm long, 10–14 times longer than wide; stellae very dense, 0.25–0.5 mm diameter, stalks 0–0.1 mm long; lateral rays 7–11, porrect or ascending; central ray present, 0.7–2 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Adult leaves* elliptical or ovate, deeply lobed throughout; lobes 3–5 on each side, obtuse, lobing index 2.5–12; lamina 5–7.5 cm long, 2–3 cm wide, 1.9–3 times longer than broad, apex obtuse or acute, base cuneate or obtuse, oblique part 4–7 mm long, obliqueness index 6–10 percent; petioles 0.7–1.4 cm long, 15–25% length of lamina, prickles present. *Upper leaf surface* grey-green or grey; prickles 4–55, straight, acicular, 1–10 mm long, prickles present on midvein only or present on midvein and lateral veins; stellate hairs distributed throughout; protostellae absent; ordinary stellae dense to very dense, 0.05–0.15 mm apart, 0.2–0.35 mm across, sessile; lateral rays 7 or 8, porrect; central ray 0.2–1.2 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Lower leaf surface* white or yellowish; prickles 6–70, straight, acicular, present on midvein only or present on midvein and lateral veins; stellae very dense, *c.* 0.05 mm apart, 0.25–0.4 mm diameter, stalks 0–0.1 mm long; lateral rays 7 or 8, porrect; central ray 0.2–1.2 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Inflorescence* supra-axillary, pseudo-racemose (male) or solitary (female), common peduncle 14–18 mm long, rachis prickles present; 12–28-flowered (male), with all flowers unisexual (dioecious species), flowers 5-merous. Flowers markedly dimorphic, with larger pricklier basal flower(s); pedicels 2–6 mm long at anthesis, same thickness throughout, 0.4–0.8 mm thick at mid-point, prickles absent or present. Calyx prickles on basal female flower 300–600, 1–5 mm long; prickles on distal male flowers 18–30, 1–4 mm long. Calyx tube 2–4 mm long, lobes deltate, 2–3.5 mm long; stellae very dense, white, brown or rusty, 0.3–0.4 mm across, stalks 0–0.1 mm long, lateral rays 7 or 8, central ray 0.7–1.4 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. Corolla purple, 11–14 mm long (male), rotate, inner surface densely stellate-hairy; anthers 4–4.5 mm long; ovary glabrous; functional style 9.5–12 mm long, erect, glabrous; stigma forked. *Fruiting calyx* tube accrescent, enclosing most or all of mature fruit, prickles 3–10 mm long. Mature fruits 1 per inflorescence, globular, *c.* 25 mm diameter; pedicels 3–5 mm long in fruit, 1.5–2 mm thick at mid-point.

***Specimens examined*: Queensland.** BURKE DISTRICT: Lawn Hill, Oct 1887, *Hann* (BRI); Lawn Hill Gorge, Aug 1979, *Farrell* 922 (AD, BRI, CANB, K, MO); Lawn Hill N.P., Jul 1985, *Williams* 85082 (BRI); Musselbrook Creek Gorge, 27.6 km by road NE of Musselbrook Mining Camp, Apr 1995, *Thomas* MRS614 & *Johnson* (AD, BRI); Amphitheatre, 40 km N of Musselbrook Mining Camp, May 1995, *Johnson* MRS787 & *Thomas* (BRI); 'Bowthorn', Jun 2001, *Fensham* 4591 (BRI). COOK DISTRICT: *c.* 50 km SW of Forsayth, *anno* 1998, *Hughes* (BRI); Cobbold Gorge, Apr 1999, *Wannan* 1187 (BRI, CANB, NSW).

***Distribution and habitat*:** In Queensland, *Solanum carduiforme* is known from the Lawn Hill National Park and surrounding area, and the Forsayth area (**Map 14**). Also known from the eastern Kimberley of Western Australia, but has not been recorded for the Northern Territory. It inhabits depressions or crevices on skeletal sandstone ridges and plateaux, in or adjacent to low eucalypt woodland.

***Phenology*:** Flowers are recorded from April to July and in October; mature fruits recorded in April and May.

***Notes*:** *S. carduiforme* is the only dioecious species indigenous to Queensland. The female plants have reduced inflorescences bearing only a single flower.

S. carduiforme is close to *S. chippendalei* but differs by the dioecious habit, the more-dissected leaves with a much "closer" tomentum, smaller fruits, and accrescent calyx.

***Conservation status*:** Currently listed as "Vulnerable" under the Queensland Nature Conservation Act, 1992.

Solanum carduiforme is restricted in its area of occupancy, but has been collected several times in recent years. It is conserved in Lawn Hill N.P. The only perceived threat to its continued existance is the small population size. Applying the IUCN guidelines (IUCN. 2001), a category of "Near Threatened" is recommended.

Group 29 (**S. incanum group**) of Whalen (1984).

Inflorescences with one (rarely two) basal bisexual flower(s) with very prickly calyx, and several male flowers with unarmed or sparsely prickly calyx (100%); calyx prickles present in fruit (100%); mature fruits 2-locular, 15–30 mm diameter, yellow or orange (100%); finger hairs absent (100%); branchlet prickles broad-based (67%); adult leaves lobed (67%).

4 species in Australia, 3 species occurring in Queensland (2 naturalised and 1 native).

This is not a very cohesive group, as *S. stupefactum* is rather different in several respects.

86. Solanum stupefactum Symon, Austrobaileya 4: 435 (1995). **Type:** Queensland. MORETON DISTRICT: northern outskirts of Yarraman township, 3 April 1975, *R.J. Henderson* 2286 (holo: BRI; iso: CANB).

Solanum sp. 4 in Ross (1986)

***Illustration*:** Symon (1995: 436)

Erect, rhizomatous perennial shrub, 1–2 m high. Juvenile stage unknown. Adult branchlets white or brown; prickles 25–45 per decimetre, straight, acicular, 4–10 mm long, 9–15 times longer than wide; stellae dense, 0.5–1.2 mm diameter, stalks 0–2 mm long; lateral rays 6–8, porrect; central ray 2–4 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs dense. *Adult leaves* ovate, entire; lamina 4.5–9 cm long, 2.2–4.3 cm wide, 1.7–2.4 times longer than broad, apex obtuse or acute, base cuneate to cordate, oblique part 0–3 mm long, obliqueness index 0–4 percent; petioles 0.8–2 cm long, 17–25% length of lamina, prickles absent or present. *Upper leaf surface* green; prickles 0–2, straight, acicular, 5–9 mm long, prickles absent or present on midvein only; stellate hairs distributed throughout; protostellae present; ordinary stellae density moderate to dense, 0.3–0.5 mm apart, 0.5–0.9 mm across, stalks 0–0.3 mm long; lateral rays 6–9, porrect; central ray 2–4 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs present throughout, 0.3–0.8 mm apart. *Lower leaf surface* green; prickles absent; stellae dense, 0.1–0.2 mm apart, 0.5–0.9 mm diameter, stalks 0–1.1 mm long; lateral rays 7 or 8, porrect; central ray 2–3 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Inflorescence* supra-axillary, pseudo-racemose, common peduncle 7–21 mm long, rachis prickles present; 5–9-flowered, strongly andromonoecious, flowers 5-merous. Flowers markedly dimorphic, with larger pricklier basal flower(s); pedicels 10–25 mm long at anthesis, same thickness throughout, 0.5–0.7 mm thick at mid-point, prickles present. Calyx prickles on basal bisexual flowers 10–18, 1–7 mm long; prickles absent from distal male flowers. Calyx tube 3–5 mm long, lobes deltate, 6–8 mm long; stellae very dense, white to brown or rusty, 0.6–1.5 mm across, stalks 0.3–1.7 mm long, lateral rays 5–7, central ray 1–3 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. Corolla mauve or purple, 9–20 mm long, rotate or shallowly lobed, inner surface glabrous; anthers 4.5–7 mm long; ovary with stellate hairs only; functional style 7–11 mm long, erect, with stellate hairs only, stellae 0.5–0.9 mm across, central ray 2–4 times as long as laterals; stigma forked, or lobed. *Fruiting calyx* with lobes less than half length of mature fruit, prickles 1–7 mm long. Mature fruits 1 per inflorescence, globular or ellipsoidal, 18–26 mm diameter, orange, conspicuously tomentose, 2-locular; placenta in cross-section stalked, anvil-shaped; mesocarp moist but not juicy; exocarp 2.2–3 mm thick; pedicels 15–25 mm long in fruit, 1.1–1.6 mm thick at mid-point; seeds pale yellow, brown or black, 2.8–3.5 mm long.

***Specimens examined*:** **Queensland.** DARLING DOWNS DISTRICT: Gowrie Mountain, undated, *Bailey* (BRI). MORETON DISTRICT: Araucaria Ranges, Dec 1856, *Mueller s.n.* (MEL [MEL12199]); Rockmount, 25 km S of Helidon, Aug 1986, *Bird* (BRI); Paradise Range, Mt Sylvia via Gatton, Sep 1986, *Williams* 86016 (BRI); S.F.289, *c.* 5 km NW of Yarraman, Jan 2000, *Bean* 15992 (BRI, MEL, NSW); adjacent to Mt Binga S.F., 11 km SE of Cooyar, Feb 2000, *Bean* 16060 (AD, BRI, CANB, MEL, NSW).

***Distribution and habitat*:** *Solanum stupefactum* is endemic to Queensland, and only in the south-east, from Yarraman to Mt Sylvia (**Map 30**). It grows on the edge of notophyll rainforest or in sclerophyll forest close to rainforest.

***Phenology*:** Flowers recorded from January to September; mature fruits recorded for February and March.

***Notes*:** A distinctive species without close relatives in Australia, but with some affinity to the African species *S. incanum*. It differs from *S. incanum* by the entire adult leaves and bright orange fruits with persistent dense stellate hairs.

Sterile specimens of *S. stupefactum* are very similar to *S. densevestitum*, particularly in leaf size, shape and indumentum, but *S. stupefactum* is a more robust plant with prickly stems and petioles.

***Conservation status*:** *S. stupefactum* is currently known from a few locations. It is not known from a conservation reserve. It is threatened by land clearing and competition from weeds, particularly *Lantana camara*. Applying the IUCN guidelines (IUCN. 2001), a category of "Vulnerable" is recommended (VU B2ab(ii,iii); C1).

87. *Solanum incanum L., Sp. Pl. 188 (1753). **Type:** Herb. J. Burser Vol. IX No. 20 (neo: UPS), *fide* Hepper & Jaeger, Kew Bull. 40: 388 (1985).

Erect, rhizomatous perennial shrub, 0.5–1.5 m high. Juvenile stage unknown. Adult branchlets brown or green; prickles 25–50 per decimetre, curved, broad-based, 3–7 mm long, 2–3 times longer than wide; stellae dense, 0.7–1 mm diameter, stalks 0–0.2 mm long; lateral rays 6–8, porrect; central ray 0.7–1.5 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Adult leaves* ovate or broadly ovate, shallowly lobed throughout; lobes 2 or 3 on each side, obtuse, lobing index 1.1–1.6; lamina 3.5–8.5 cm long, 2.3–5 cm wide, 1.5–1.7 times longer than broad, apex obtuse or acute, base cuneate or obtuse, oblique part 0–2 mm long, obliqueness index 0–2 percent; petioles 0.8–1.7 cm long, 20–30% length of lamina, prickles present. *Upper leaf surface* grey-green; prickles 3–11, straight, broad-based, 5–10 mm long, prickles present on midvein only or present on midvein and lateral veins; stellate hairs distributed throughout; protostellae absent; ordinary stellae density moderate to dense, 0.3–0.5 mm apart, 0.4–0.7 mm across, sessile; lateral rays 4–8, porrect; central ray 0.8–1.2 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Lower leaf surface* green to white; prickles 5–15, straight, broad-based, prickles present on midvein only or present on midvein and lateral veins; stellae dense, 0.1–0.2 mm apart, 0.5–0.7 mm diameter, stalks 0–0.2 mm long; lateral rays 7 or 8, porrect; central ray 0.8–1.2 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Inflorescence* supra-axillary, solitary or pseudo-umbellate, common peduncle absent; 1–3-flowered, strongly andromonoecious, flowers 5-merous. Flowers markedly dimorphic, with larger pricklier basal flower(s); pedicels 5–10 mm long at anthesis, same thickness throughout, 0.4–1 mm thick at mid-point, prickles absent or present. Calyx prickles on basal bisexual flowers 10–30, 2–7 mm long; prickles absent from distal male flowers. Calyx tube 3–4 mm long, lobes deltate or rostrate, 1.5–2.5 mm long; stellae very dense, yellow or white, 0.6–0.8 mm across, stalks 0–0.2 mm long, lateral rays 7 or 8, central ray 0.8–1.2 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. Corolla purple, 9–12 mm long, rotate, inner surface sparsely stellate-hairy; anthers 4.5–5 mm long; ovary with stellate and Type 2 hairs; functional style 6.5–7 mm long, erect, with stellate and Type 2 hairs, stellae 0.6–0.7 mm across, lateral rays *c.* 9, central ray 0.5–1 times as long as laterals. *Fruiting calyx* with lobes less than half length of mature fruit, prickles 4–7 mm long. Mature fruits 1 per inflorescence, globular, 18–22 mm diameter, yellow, 2-locular; placenta in cross-section stalked, anvil-shaped; mesocarp moist but not juicy; exocarp *c.* 1 mm thick; pedicels 15–20 mm long in fruit, 0.8–1.2 mm thick at mid-point; seeds pale yellow or brown to black, 2–2.6 mm long.

***Specimens examined*:** **Queensland.** Port Curtis District: Castletower Creek, Awoonga Dam, Calliope Shire, Aug 1987, *Gibson* 852 (BRI); 2 Tabala Rd, Calliope, ex Kroombit road, Nov 1998, *Worthington* 1930 (BRI); Awoonga Dam, 1 km east of Charters Crossing, Aug 2000, *Bean* 16804 (BRI, K, MEL, NSW).

***Distribution and habitat*:** *Solanum incanum* is native to Africa. In Australia, it is naturalised only in the Calliope area south-west of Gladstone (**Map 30**), where it inhabits degraded sites, including rodsides and cleared alluvial flats.

***Phenology*:** Flowers recorded for August only; mature fruits recorded for August and November. The species probably produces flowers and fruits for several months of the year.

Notes: *S. incanum* was first collected in Queensland in 1987, but not identified until recently.

88. *Solanum linnaeanum Hepper & P.Jaeger, Kew Bull. 41: 435 (1986). **Type:** South Africa. Somerset Div., Bosch Berg, June 1813, *W.J. Burchell* 3238 (holo: K, *n.v.*).

Solanum sodomeum, nom. rej., fide Hepper, Taxon 27: 555 (1979)

Solanum hermannii Dunal, *nom. illeg.* (= *S. sodomeum*)

***Illustrations*:** H. Heine, Solanaceae in Flore de la Nouvelle Calédonie, p. 147 (1976), as *S. sodomeum*; Cunningham *et al.* (1981: 594), as *S. sodomaeum*; Symon (1981: 265), as *'S. hermanni' (sic).*

Erect, rhizomatous perennial shrub, 0.7–1.5 m high. Juvenile stage unknown. Adult branchlets grey, brown or green; prickles 10–25 per decimetre, straight, broad-based, 3–7 mm long, 2–3 times longer than wide; stellae sparse, 0.25–0.4 mm diameter, stalks 0–0.2 mm long; lateral rays 7 or 8, porrect; central ray 0.1–1.5 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Adult leaves* ovate or broadly ovate, deeply lobed throughout; lobes 3 or 4 on each side, obtuse, lobing index 5–13; lamina 5–12.5 cm long, 2.8–8 cm wide, 1.4–1.9 times longer than broad, apex obtuse, base cuneate or obtuse, oblique part 0–10 mm long, obliqueness index 0–8 percent; petioles 0.6–2.7 cm long, 10–25% length of lamina, prickles present. *Upper leaf surface* green; prickles 9–25, straight, broad-based, 3–13 mm long, prickles present on midvein and lateral veins; stellate hairs distributed throughout; protostellae absent; ordinary stellae very sparse, 0.9–2 mm apart, 0.25–0.4 mm across, sessile; lateral rays 6–9, porrect; central ray 0.7–2 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Lower leaf surface* green; prickles 8–20, straight, broad-based, prickles present on midvein and lateral veins; stellae sparse to moderate, 0.5–1 mm apart, 0.4–1 mm diameter, stalks 0–0.1 mm long; lateral rays 6–8, porrect; central ray 0.8–2 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Inflorescence* supra-axillary, pseudo-umbellate, common peduncle absent; 3–5-flowered, strongly or weakly andromonoecious, flowers 5-merous. Flowers markedly dimorphic, with larger pricklier basal flower(s); pedicels 4–12 mm long at anthesis, same thickness throughout, 0.6–0.9 mm thick at mid-point, prickles present. Calyx prickles on basal bisexual flowers 60–100, 0.5–5 mm long; prickles on distal male flowers 12–25, 0.5–3 mm long. Calyx tube 3–5 mm long, lobes elliptic or deltate, 2–5.5 mm long; stellae moderate to dense, white or transparent, 0.2–0.5 mm across, sessile, lateral rays 4–7, central ray 0.5–1.5 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs present. Corolla purple, 8–15 mm long, shallowly or deeply lobed, inner surface sparsely stellate-hairy; anthers 5–6 mm long; ovary glabrous or with stellate hairs only; functional style 7.5–9 mm long, erect, with stellate hairs only, stellae 0.2–0.25 mm across, lateral rays 6–8, central ray 1.5–2 times as long as laterals. *Fruiting calyx* with lobes less than half length of mature fruit, prickles 1–5 mm long. Mature fruits 1 or 2 per inflorescence, globular, 23–30 mm diameter, yellow, 2-locular; placenta in cross-section stalked, anvil-shaped; mesocarp moist but not juicy; exocarp 1–2.5 mm thick; pedicels 17–21 mm long in fruit, 1.5–3 mm thick at mid-point; seeds brown to black, 2.9–3.5 mm long. *Apple of Sodom.* **Fig. 10.**

***Selected specimens*:** **Queensland.** SOUTH KENNEDY DISTRICT: Plateau road, Crediton, SE of Eungella, Apr 2002, *Bean* 18656 (BRI, MEL). WIDE BAY DISTRICT: 9.6 km S of Gunalda, Mar 1973, *Price s.n.* (BRI); Mary River, Conondale on the Maleny–Kenilworth road, Aug 1975, *Coveny* 6730 & *Hind* (BRI, NSW); Currymore, NW of Maleny, Apr 1993, *Bean* 6017 (BRI); 0.8 km S of Kenilworth P.O., Aug 1999, *Bean* 15243 (BRI). MORETON DISTRICT: Victoria Park, Oct 1888, *Simmonds* (BRI); Caloundra, North Coast Line, Aug 1933, *Everist* 402 (BRI); Flagstone via Tamborine, Nov 1963, *Wood* (BRI); Mt Glorious–Samford road, Jan 1965, *Henderson* H105 (BRI); Dunwich, North Stradbroke Is, Sep 1969, *Coveny* 2070 (BRI, NSW); Zillmere, Brisbane, Sep 1980, *Dillewaard* 16 & *Olsen* (BRI); Long Pocket road, Indooroopilly, Brisbane, May 1981, *Dillewaard* 603 & *Stanley* (AD, BRI); 3 km W of Ripley, S of Swanbank powerhouse, Jan 1986, *Dowling s.n.* (BRI); 1 km N of Bellthorpe Forest station, Conondale Range, Oct 1993, *Halford* Q1909 (BRI); Banks Creek road, 6 km NE of Fernvale, Jul 2000, *Bean* 16711 (BRI, MEL); 1.2 km along Tabletop road, S of Canungra, Apr 2001, *Bean* 17598 (BRI).

***Distribution and habitat*:** *Solanum linnaeanum* is native to South Africa. In Queensland, it is naturalised in areas south from Gunalda, within about 50 km of the coast, and then on the Eungella plateau west of Mackay (**Map 32**). It is also naturalised in New South Wales. It grows on degraded sites, including pasture and roadsides.

***Phenology*:** Flowers are recorded from July to December; fruits may be found throughout the year.

***Notes*:** *S. linnaeanum* is one of Australia's first recorded introduced weeds. It was found by Robert Brown around Port Jackson in 1802. The first Queensland naturalisation (around Brisbane) was recorded by Bailey (1881).

Group 33 (**S. rostratum group**) of Whalen (1984)

Corolla yellow, rotate; one anther much longer than the remainder; calyx prickles abundant; lower leaf surface and calyx with Type 2 hairs; style sigmoid; seeds brown to black; hypanthium accrescent, enclosing the fruit; adult leaves deeply lobed.

12 species in North and South America; 1 species naturalised in Australia, and present in Queensland.

89. *Solanum rostratum Dunal, Hist. Nat. Solanum 234, t. 24 (1813); *Nycterium rostratum* (Dunal) Link, Enum. Hort. Berol. 1: 189 (1821); *Androcera rostrata* (Dunal) Rydb., Bull. Torrey Bot. Club 33: 150 (1906). **Type:** cultivated at Montpellier, undated, *coll. unknown* (holo: MPU; iso: G-DC, P), *fide* Whalen (1979).

***Illustration*:** Cunningham *et al.* (1981: 595); Symon (1981: 109)

Sprawling or erect, herbaceous resprouter or rhizomatous perennial shrub, 0.3–0.6 m high. Juvenile stage unknown. Adult branchlets brown or green; prickles 180–240 per decimetre, straight, acicular or broad-based, 1–7 mm long, 6–9 times longer than wide; stellae sparse to dense, 0.3–1.3 mm diameter, stalks 0–0.1 mm long; lateral rays 4–7, porrect or ascending; central ray 0.8–1.5 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs absent. *Adult leaves* elliptical, ovate or broadly ovate, deeply lobed throughout; lobes 3 or 4 on each side, obtuse, lobing index 9–50; lamina 4–8 cm long, 2.1–4.2 cm wide, 1.5–1.9 times longer than broad, apex obtuse, base cuneate to cordate, oblique part 0–3 mm long, obliqueness index 0–4 percent; petioles 1.3–2.9 cm long, 35–50% length of lamina, not winged or winged, prickles present. *Upper leaf surface* green; prickles 9–35, straight, broad-based, 2–7 mm long, prickles present on midvein and lateral veins; stellate hairs distributed throughout; protostellae present; ordinary stellae density moderate, 0.3–0.8 mm apart, 0.6–0.9 mm across, sessile; lateral rays 4–6, porrect; central ray 1–1.7 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs present throughout, 0.1–0.2 mm apart. *Lower leaf surface* green; prickles 10–20, straight, broad-based, prickles present on midvein and lateral veins; stellae moderate to dense, 0.2–0.5 mm apart, 0.8–1.1 mm diameter, stalks 0–0.1 mm long; lateral rays 4–8, porrect; central ray 1–1.7 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs present throughout, 0.2–0.4 mm apart. *Inflorescence* supra-axillary, pseudo-racemose, common peduncle 5–20 mm long, rachis prickles present; 5–10-flowered, weakly andromonoecious, flowers 5-merous; pedicels 3–6 mm long at anthesis, markedly thicker distally, 0.5–0.7 mm thick at mid-point, prickles present. Calyx tube 2.5–3.5 mm long, lobes deltate or attenuate, 4–5.5 mm long; prickles present at anthesis, 100–250 per flower, 1–9 mm long; stellae dense, transparent, 0.6–1.3 mm across, stalks 0–0.3 mm long, lateral rays 4–8, central ray 0.8–1.5 times as long as laterals, not gland-tipped; finger hairs absent; Type 2 hairs present. Corolla yellow, 9–15 mm long, rotate, inner surface glabrous; anthers 3.5–7.5 mm long; ovary glabrous; functional style *c.* 13 mm long, sigmoid, glabrous. *Fruiting calyx* tube accrescent, enclosing most or all of mature fruit, prickles 1–11 mm long. Mature fruits 4–8 per inflorescence, globular, 9–12 mm diameter, 2-locular; mesocarp dry; pedicels 6–10 mm long in fruit, 1–1.2 mm thick at mid-point; seeds brown to black, 2–2.7 mm long. *Buffalo Burr.*

***Specimens examined*:** **Queensland.** BURNETT DISTRICT: 5 miles SW of Gayndah, Nov 1971, *Sauer* (BRI). DARLING DOWNS DISTRICT: Jandowae, Portion 69, Parish Canaga, Nov 1961, *Sperling* (BRI); 28 km W of Miles, Dec 1973, *Pollock* (BRI); 'Rosewood Downs', Limevale, Mar 1981, *Major* (BRI); Portion 28V, Shire of Clifton, Dec 1983, *Achilles*

(BRI); Clifton, Dec 1983, *Beitz* (BRI). MORETON DISTRICT: Gatton, Feb 1906, *Bailey* (BRI). **New South Wales.** NORTH WEST SLOPES: Warialda district, Dec 1961, Vet. Inspector (NSW).

***Distribution and habitat*:** *Solanum rostratum* is indigenous to the U.S.A. and Mexico. There have been sporadic naturalisation records from several parts of south-eastern Queensland (**Map 24**), with the most recent record being in 1983. It is naturalised in all southern Australian states except Tasmania. It grows on degraded sites (pastures and crops).

***Phenology*:** Flowers are recorded in November and December; fruits are recorded in March, November and December.

***Notes*:** This is the only species of the American *S.* sect. *Androceras* that is naturalised in Australia (Whalen 1979), and the only Australian species of *Solanum* (native or naturalised) with yellow flowers.

I have been unable to locate populations of *S. rostratum* in Queensland, and it is rather doubtful whether it still occurs here.

Ungrouped. Whalen (1984) did not assign this species to any group

90. *Solanum sisymbriifolium Lam., Tabl. Encycl. 2: 25 (1794). **Type:** Buenos Aires, Argentina, undated, *P. Commerson* (syn: P-LAM), microfiche 469.14.

***Illustration*:** Symon (1981: 111)

Erect, rhizomatous perennial shrub, 0.8–1.5 m high. Juvenile stage unknown. Adult branchlets brown or green; prickles 30–60 per decimetre, straight or curved, broad-based, 1–12 mm long, 5–7 times longer than wide; stellae dense, 0.3–0.5 mm diameter, sessile; lateral rays 6–12, ascending or multiradiate; central ray 1.5–3 times as long as laterals, not gland-tipped or gland-tipped; finger hairs present, gland-tipped, 0.2–0.4 mm long; Type 2 hairs absent. *Adult leaves* broadly ovate, deeply lobed throughout; lobes 4–6 on each side, acute, lobing index 2.5–11; lamina 8–12 cm long, 5.5–8.5 cm wide, 1.4–1.8 times longer than broad, apex acute, base obtuse or cordate, oblique part 0–5 mm long, obliqueness index 0–5 percent; petioles 2.1–4.6 cm long, 21–40% length of lamina, winged, prickles present. *Upper leaf surface* green; prickles 9–30, straight, broad-based, 1–10 mm long, prickles present on midvein and lateral veins; stellate hairs distributed throughout; protostellae absent; ordinary stellae sparse to moderate density, 0.3–0.5 mm apart, 0.3–0.5 mm across, sessile; lateral rays 4–6, ascending; central ray 1–3 times as long as laterals, not gland-tipped; finger hairs present, 0.2–0.9 mm apart, gland-tipped, 0.2–0.3 mm long; Type 2 hairs absent. *Lower leaf surface* green; prickles 7–20, straight, broad-based, prickles present on midvein and lateral veins; stellae moderate, 0.3–0.6 mm apart, 0.4–0.6 mm diameter, sessile; lateral rays 4–7, ascending; central ray 1–2 times as long as laterals, not gland-tipped; finger hairs present, 0.2–0.4 mm apart, gland-tipped, 0.2–0.3 mm long; Type 2 hairs absent. *Inflorescence* supra-axillary, pseudo-racemose, common peduncle 15–52 mm long, rachis prickles present; 4–11-flowered, weakly andromonoecious, flowers 5-merous. Flowers all similar; pedicels 5–12 mm long at anthesis, same thickness throughout, 0.5–0.7 mm thick at mid-point, prickles present. Calyx tube 1.5–3 mm long, lobes deltate, 5–6.5 mm long; prickles present at anthesis, 25–90 per flower, 1–7 mm long; stellae dense, transparent, 0.4–0.6 mm across, sessile, lateral rays 6–10, central ray 2–3 times as long as laterals, not gland-tipped or gland-tipped; finger hairs present; Type 2 hairs absent. Corolla white, 11–16 mm long, rotate or shallowly lobed, inner surface glabrous; anthers 8–10 mm long; ovary with Type 2 hairs only; functional style 15.5–17 mm long, erect, with Type 2 hairs only or with stellate and Type 2 hairs, stellae *c.* 0.25 mm across, lateral rays *c.* 6, central ray 2–3 times as long as laterals. *Fruiting calyx* with lobes more than half length of mature fruit, prickles 2–10 mm long. Mature fruits 1–3 per inflorescence, globular, 15–20 mm diameter, red; pedicels 17–25 mm long in fruit, 1.1–1.9 mm thick at mid-point; seeds pale yellow, 2.9–3.2 mm long.

***Specimens examined*:** **Queensland.** DARLING DOWNS DISTRICT: near Toowoomba, Bellview St, Jan 1921, *Leslie* (BRI); near Toowoomba, Mar 1953, *Clydesdale* (BRI); Toowoomba, S of Picnic Point, Oct 1964, *Everist* 7772 (BRI); 17 Trafalgar St Toowoomba, Mar 1996, *Story* (BRI); Nelson St Reservoir, Toowoomba, Jul 1996, *Bean* 10448 (BRI); corner Nelson St and Ramsay St, Toowoomba, Dec 2001, *Bean* 18166 (BRI, MEL, NSW).

***Distribution and habitat*:** *Solanum sisymbriifolium* is indigenous to Bolivia, Brazil, Paraguay and Argentina in South America. In Queensland it is known only from Toowoomba (**Map 32**), where it has been naturalised for over 80 years. It grows on degraded sites in urban bushland, although once recorded as a weed of cultivation paddocks. Also naturalised in New South Wales and Western Australia.

***Phenology*:** Flowers are recorded between October and March; mature fruits recorded in July and December.

***Notes*:** Not assigned to a group by Whalen (1984), but appears to have affinity with the *S. incanum* group (strongly andromonoecious inflorescences, large fruits, somewhat dimorphic flowers).

Species doubtfully naturalised or formerly naturalised in Queensland

Solanum aculeastrum Dunal

Shrub to 2 m high, with large broad-based prickles, leaves that are white on the underside, and fruits about 3 cm across.

***Specimens examined*:** **Queensland.** MORETON DISTRICT: Victoria Park, Brisbane, Oct 1887, *Simmonds s.n.* (BRI); Cleveland, Aug 1906, *Rowney s.n.* (BRI); Sandgate, Moreton Bay, Sep 1915, *White s.n.* (BRI); Currumbin Heights, Nov 1962, *Wallace s.n.* (BRI).

***Notes*:** *S. aculeastrum* is native to South Africa, and formerly naturalised in Queensland. Bailey (1881) stated that it "is met with in places covering acres of land, with shrubs of from 6 to 9 feet in height". It has not been recorded since 1962.

Solanum dimidiatum Raf.

Shrub to 50 cm high, with deeply lobed leaves, acicular prickles on branchlets but none on the calyx.

***Specimens examined*:** **Queensland.** WIDE BAY DISTRICT: Bundaberg, Dec 1963, *Arnold s.n.* (BRI); Greatheads Rd, Bundaberg, Mar 1966, *Draper* (BRI); Bundaberg, May 1972, *Henderson* 1322 (BRI).

***Notes*:** *S. dimidiatum* was actively targeted for eradication in the Bundaberg area, and has not been seen since 1972.

Solanum lasiophyllum Dunal

A shrub with broad felty entire leaves and prickly stems. Calyx prickly, accrescent in fruit.

***Specimens examined*:** **Queensland.** WIDE BAY DISTRICT: Bingera, Gibbsons and Howes Sugar Mill, Oct 1981, *Sarnadsky s.n.* (BRI)

***Notes*:** *S. lasiophyllum* is an Australian species occurring commonly in Western Australia. A small population was documented from near Bundaberg in 1981, but it did not persist.

Solanum pseudolulo Heiser

A small shrub with broad shallowly-lobed leaves, prickles abundant on leaves and stems, calyx without prickles, fruits large and tomentose.

***Specimens examined*:** **Queensland.** COOK DISTRICT: Cairns Airport sewage treatment plant, Jun 2000, *King s.n.* (BRI). MORETON DISTRICT: Cross St, Sinnamon Farm, Goodna, Ipswich, Jun 1988, *Perrott s.n.* (BRI).

***Notes*:** The fruits of *S. pseudolulo* are edible, and it is often grown for that reason. These records are non-cultivated, but neither population has persisted. It is related to *S. lasiocarpum* Dunal.

Solanum pyracanthos Lam.

A shrub with deeply lobed, sparsely pubescent leaves and abundant orange prickles.

***Specimen examined*:** **Queensland.** MORETON DISTRICT: Bowen Park, Feb 1907, *White s.n.* (BRI).

***Notes*:** *S. pyracanthos* was recorded by Bailey (1881) as being naturalised in Brisbane, with the comment that "this species was introduced some years ago as an ornamental plant by the Queensland Acclimitisation Society, from whose grounds it has spread into the pasture". It is a native of Madagascar.

Excluded Species

Solanum tumulicola Symon

All Queensland specimens previously assigned to this species have proven to be *S. esuriale* Lindl.

Solanum coactiliferum J.M.Black

All Queensland specimens previously assigned to this species are referrable to *S. ammophilum* A.R.Bean.

Acknowledgements

Numerous people have assisted me in locating various species of *Solanum* in the field, or have collected material for me. I thank Andrew Ford, Keith McDonald, Bill McDonald, Paul Forster, Harry Hines, Bob Philips, Lana Little, Rod Fensham, Ed Meyer, Matt Bloor, Irene Champion, Steve Pearson, Megan Thomas and John Thompson. I am grateful to the Directors of AD, BH, BM, DNA, K, MEL, NSW, PERTH, PR and QRS for loan of specimens; Laurie Jessup for guiding me through the intricacies of DELTA; Will Smith for the art work and distribution maps; Peter Bostock for photographing some types while Australian Botanical Liaison Officer at Kew, and also for the Latin descriptions; Donovan Sharp for assistance with the stellate-hair images; and Wayne Harris for assistance with the photographing of type specimens.

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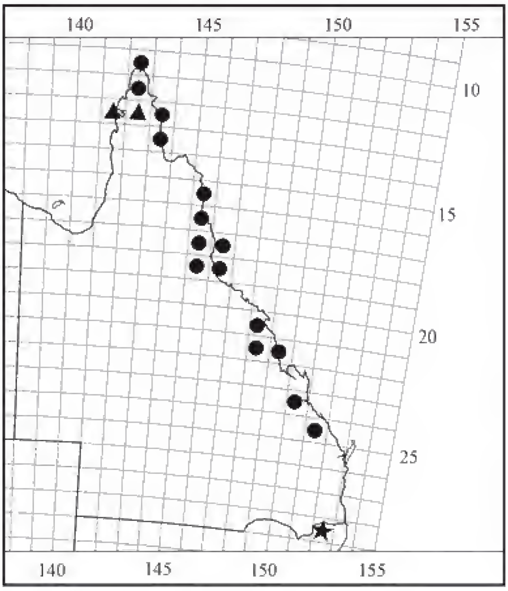
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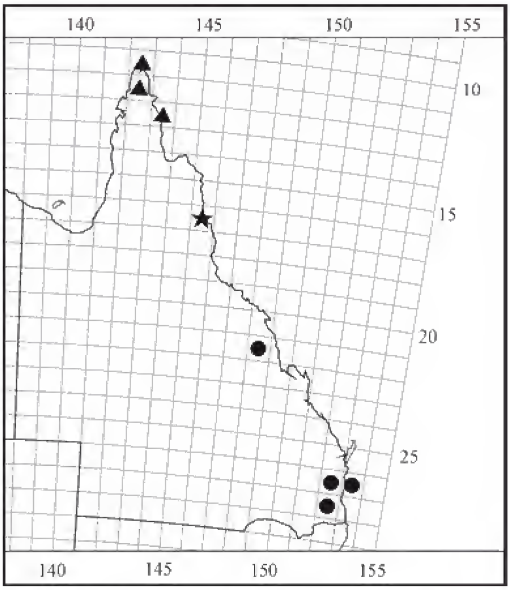
Map 1. Distribution of *Solanum dunalianum* ▲, *S.viridifolium* ● and *S.hapalum* ★.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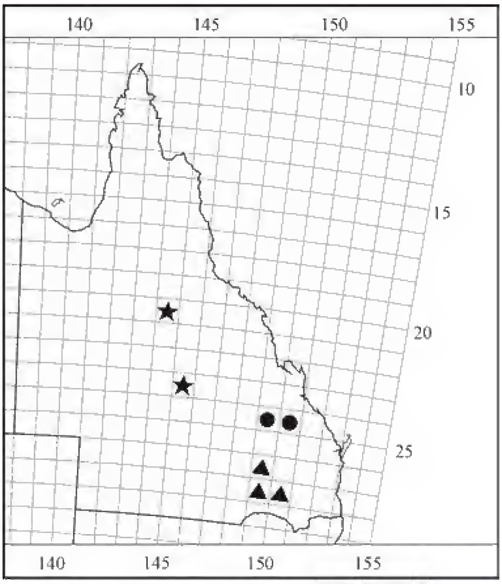
Map 2. Distribution of *Solanum densevestitum* ●, *S. fervens* ▲ and *S. dimorphispinum* ★.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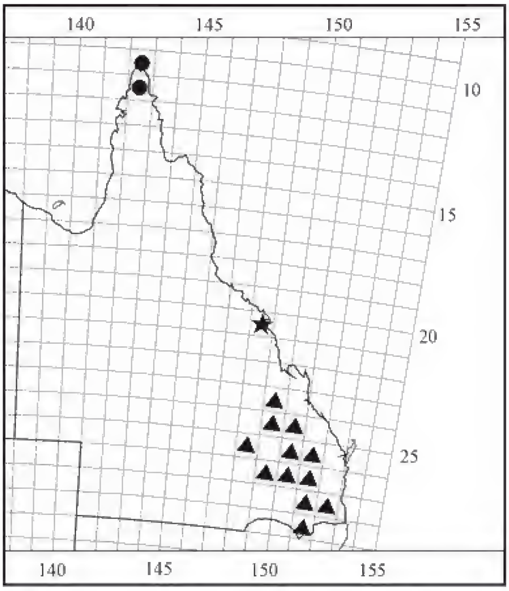
Map 3. Distribution of *Solanum johnsonianum* ●, *S. innoxium* ▲ ,and *S. ultimum* ★.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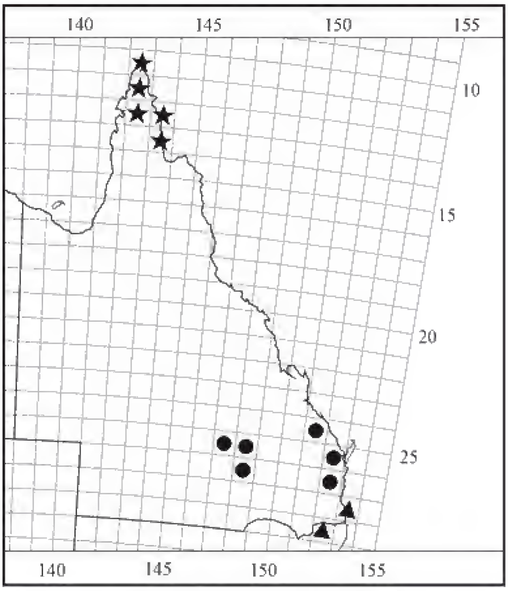
Map 4. Distribution of *Solanum nemophilum* ▲, *S. yirrkalense* ● and *S. dryanderense* ★.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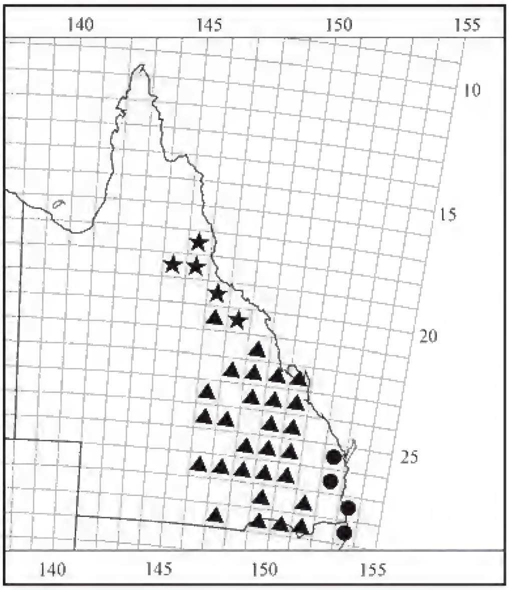
Map 5. Distribution of *Solanum gympiense* ● , *S. defensum* ★ and *S. mentiens* ▲ .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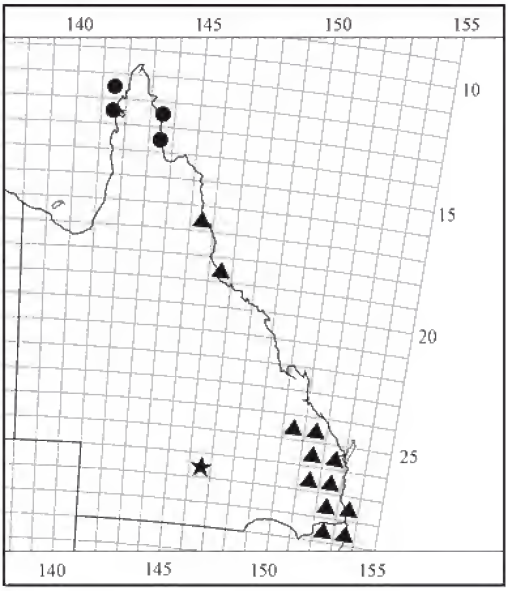
Map 6. Distribution of *Solanum shirleyanum* ● , *S. parvifolium ssp. parvifolium* ▲ and *S. parvifolium ssp. tropicum* ★ .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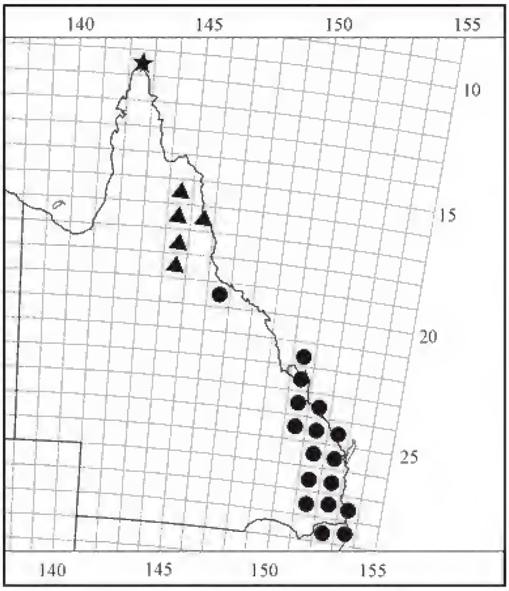
Map 7. Distribution of *Solanum discolor* ● , *S.corifolium* ▲ ,and *S.versicolor* ★ .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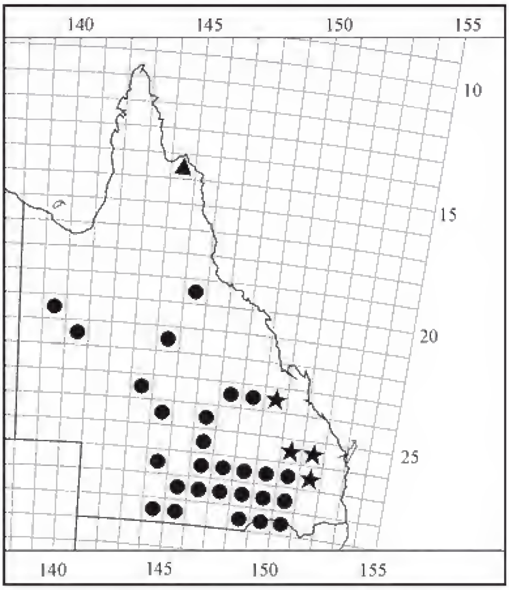
Map 8. Distribution of *Solanum stelligerum* ● , *S. lasiocarpum* ★ and *S. multiglochidiatum* ▲ .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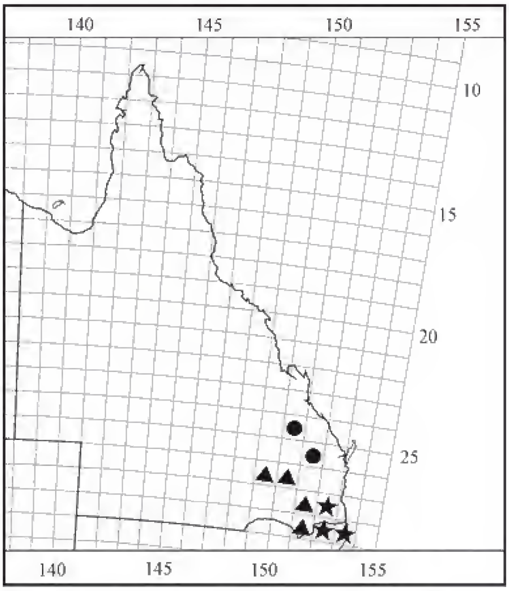
Map 9. Distribution of *Solanum ferocissimum* ●, *S. dysprosium* ▲ and *S. latens* ★.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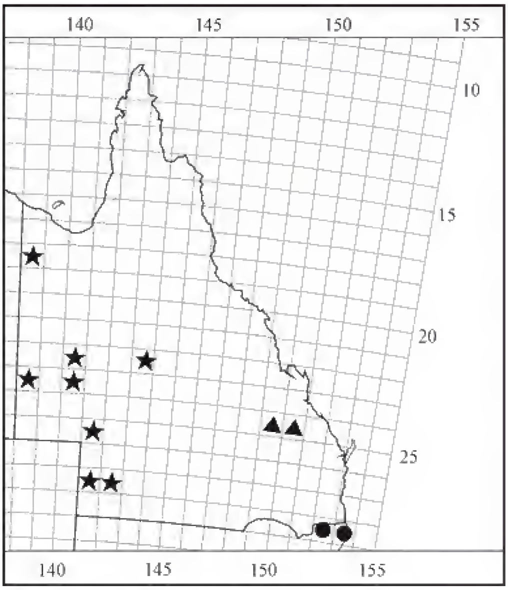
Map 10. Distribution of *Solanum lythrocarpum* ●, *S. coracinum* ▲ and *S. semiarmatum* ★.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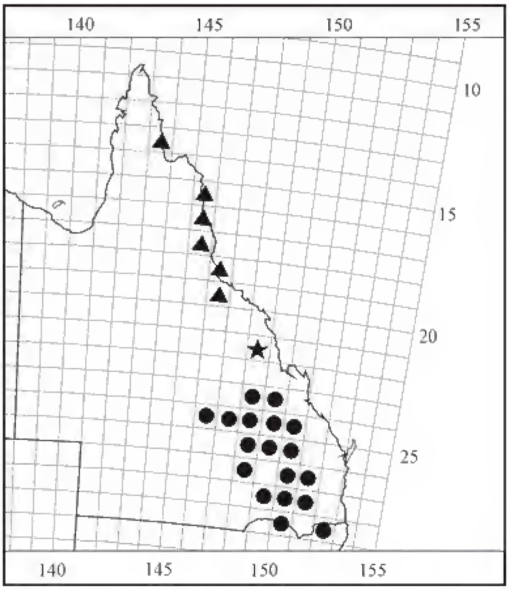
Map 11. Distribution of *Solanum dissectum* ▲, *S. inaequilaterum* ●, and *S. chenopodinum* ★.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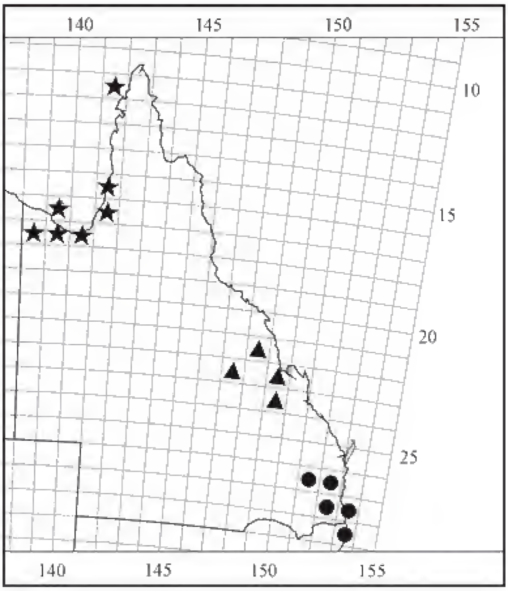
Map 12. Distribution of *Solanum mitchellianum* ●, *S. cookii* ▲ and *S. francisii* ★.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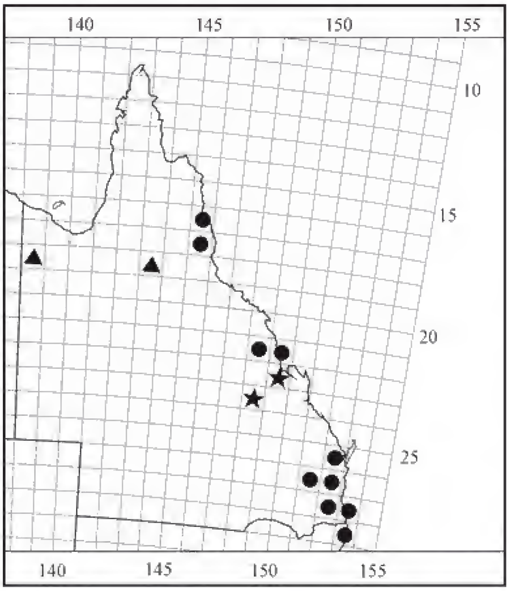
Map 13. Distribution of *Solanum chrysotrichum* ●, *S.pugiunculiferum* ★ and *S. adenophorum* ▲.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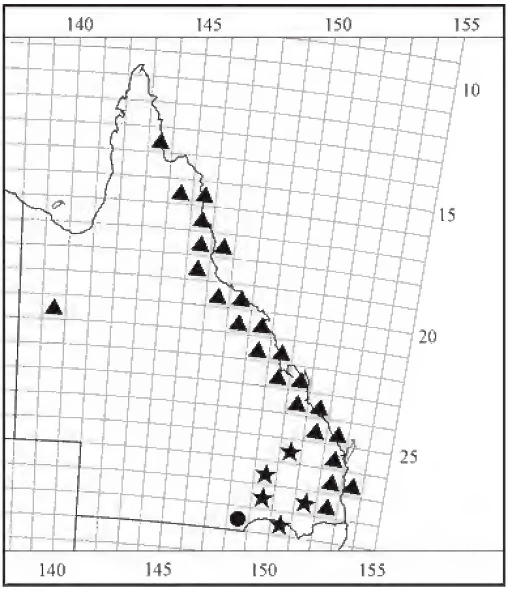
Map 14. Distribution of *Solanum capsicoides* ●, *S. pusillum* ★ and *S. carduiforme* ▲.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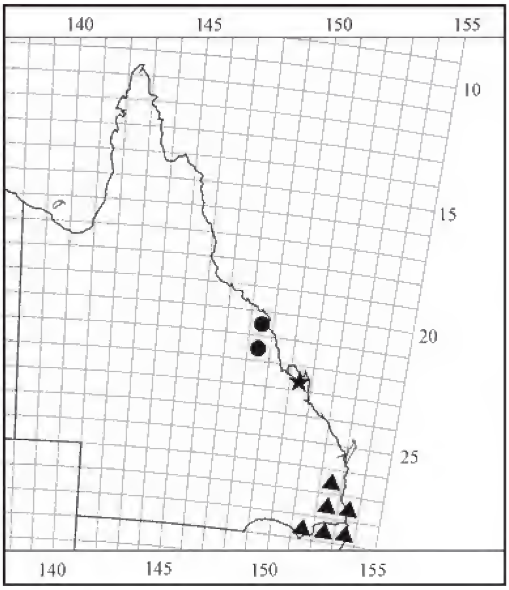
Map 15. Distribution of *Solanum lacunarium* ●, *S. torvum* ▲ and *S. stenopterum* ★.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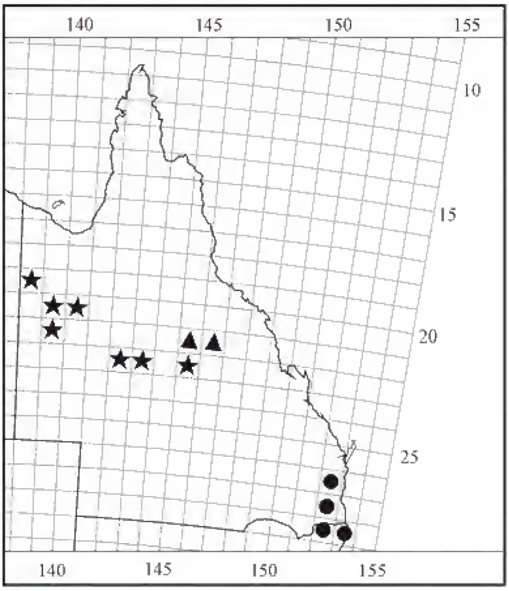
Map 16. Distribution of *Solanum ditrichum* ▲, *S. graniticum* ● and *S. dianthophorum* ★.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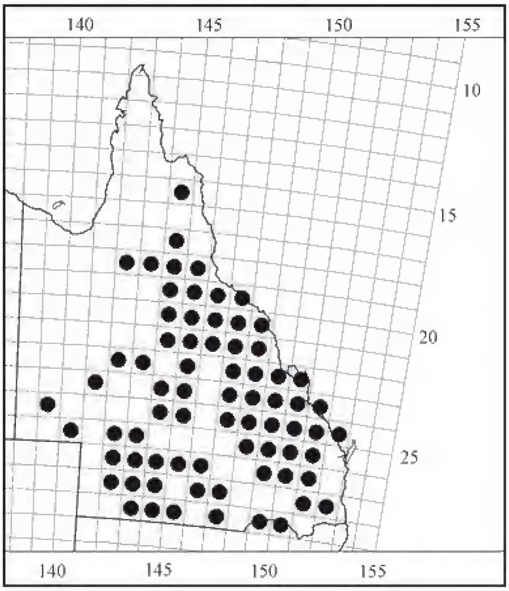
Map 17. Distribution of *Solanum vicinum* ●, *S.senticosum* ★ and *S. crebrispinum* ▲.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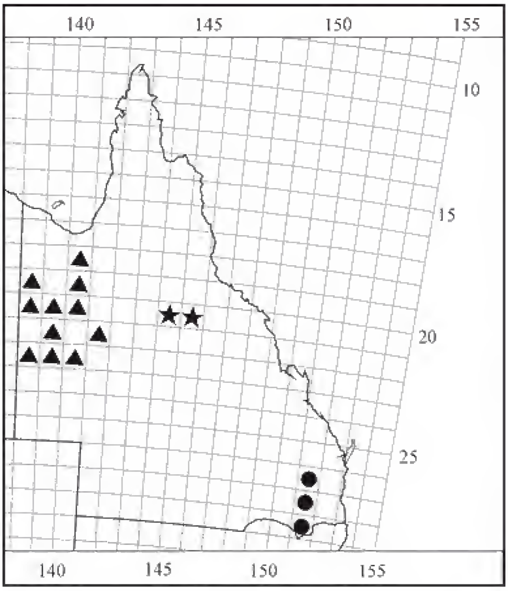
Map 18. Distribution of *Solanum ellipticum* ●.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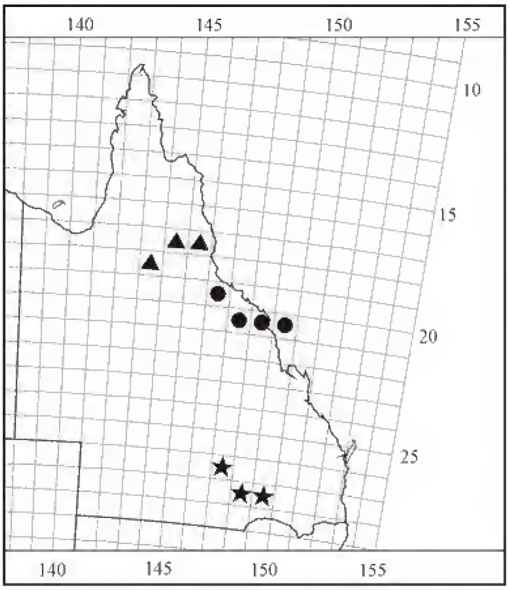
Map 19. Distribution of *Solanum papaverifolium* ●, *S. quadriloculatum* ▲, and *S. crassitomentosum* ★.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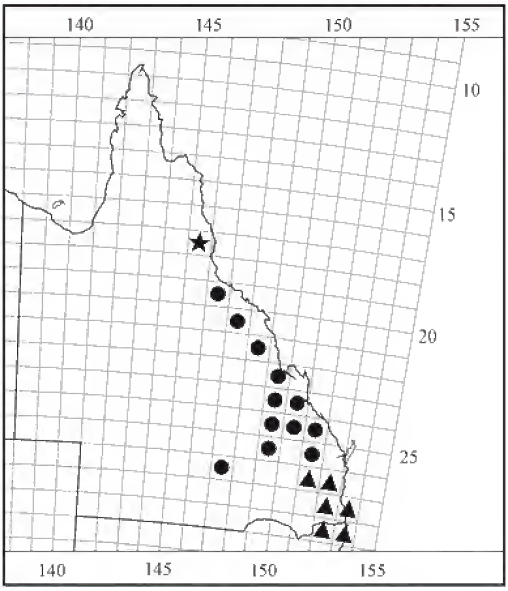
Map 20. Distribution of *Solanum angustum* ▲, *S. sporadotrichum* ● and *S. argopetalum* ★.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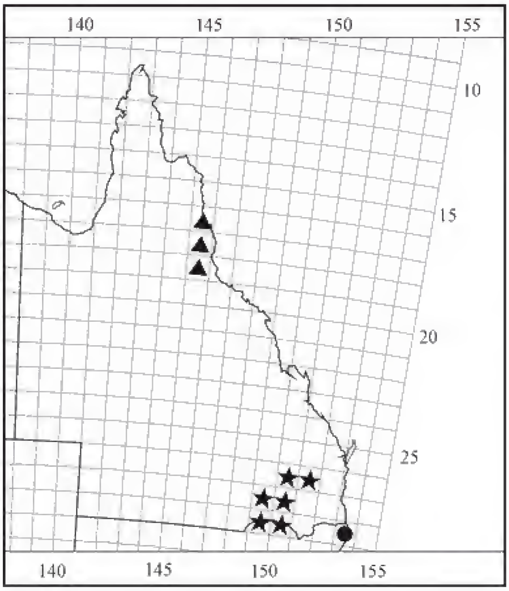
Map 21. Distribution of *Solanum furfuraceum* ● , *S. rixosum* ▲ and *S. hamulosum* ★ .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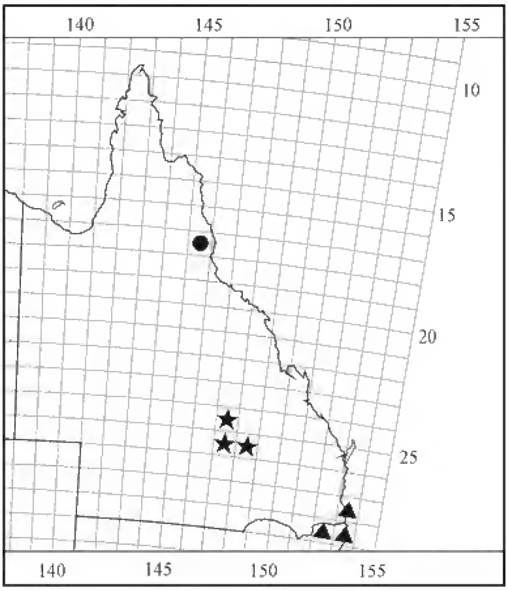
Map22 . Distribution of *Solanum macoorai* ▲ , *S. acanthodapis* ● and *S. tetrathecum* ★ .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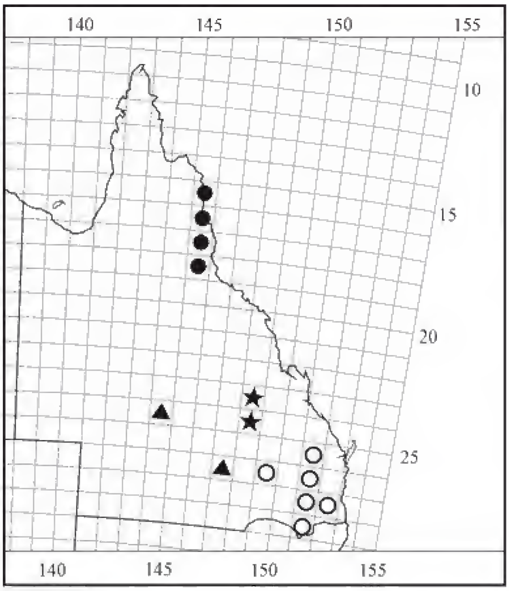
Map 23. Distribution of *Solanum dumicola* ★ , *S. eminens* ● , and *S. serpens* ▲ .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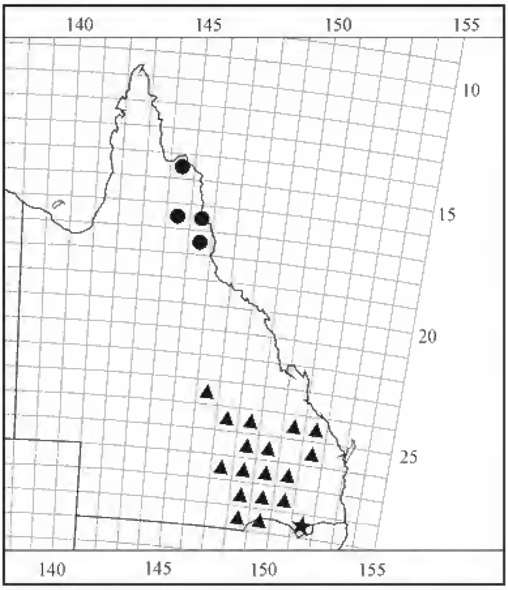
Map 24. Distribution of *Solanum magnifolium* ● , *S. cocosoides* ★ , *S. centrale* ▲ and *S. rostratum* ○ .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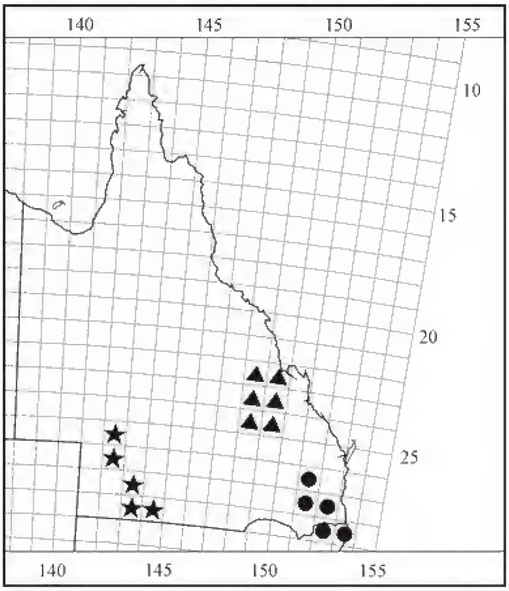
Map 25. Distribution of *Solanum cinereum* ★, *S.intonsum* ● and *S. jucundum* ▲.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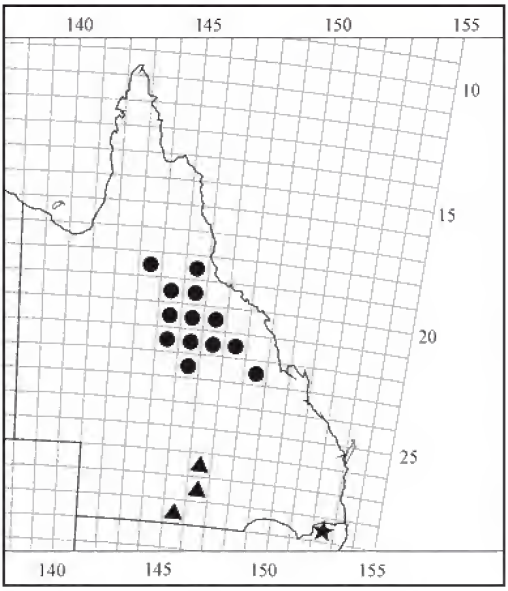
Map 26. Distribution of *Solanum elachophyllum* ▲, *S.limitare* ● and *S. sturtianum* ★.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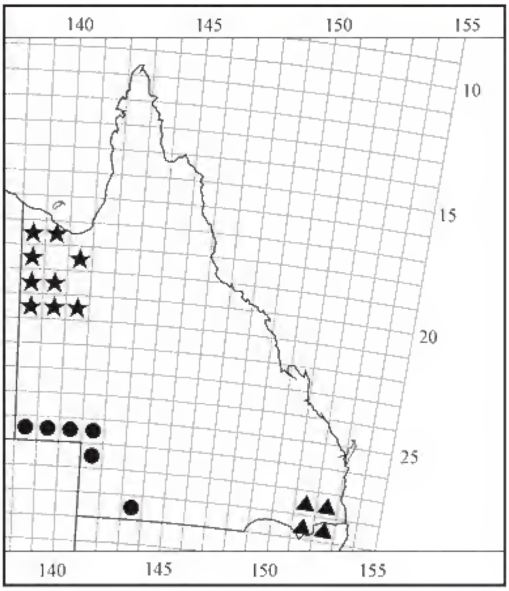
Map 27. Distribution of *Solanum ammophilum* ▲, *S. galbinum* ● , and *S. nobile* ★.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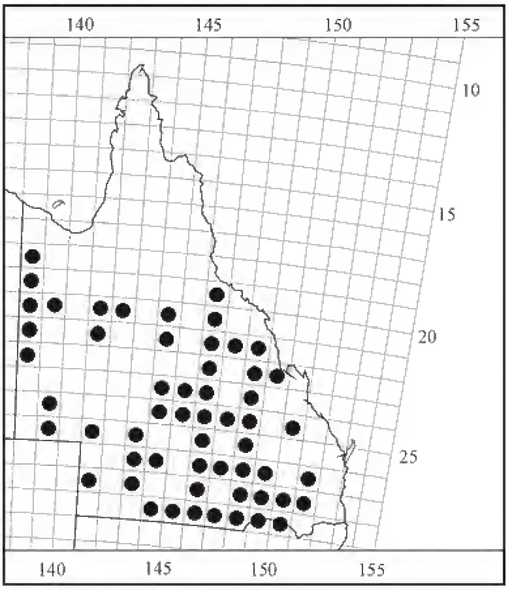
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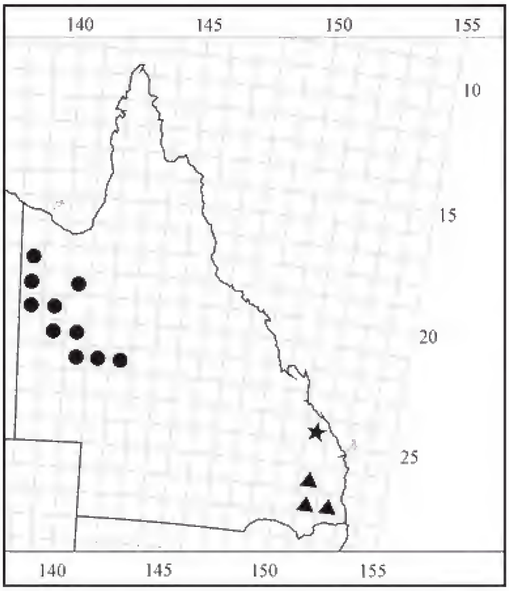
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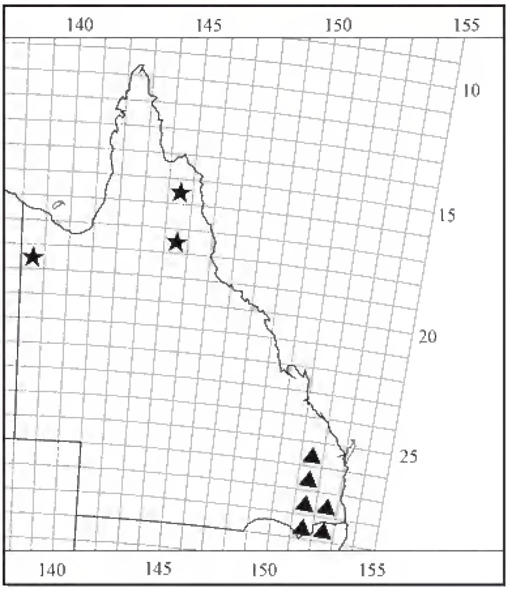
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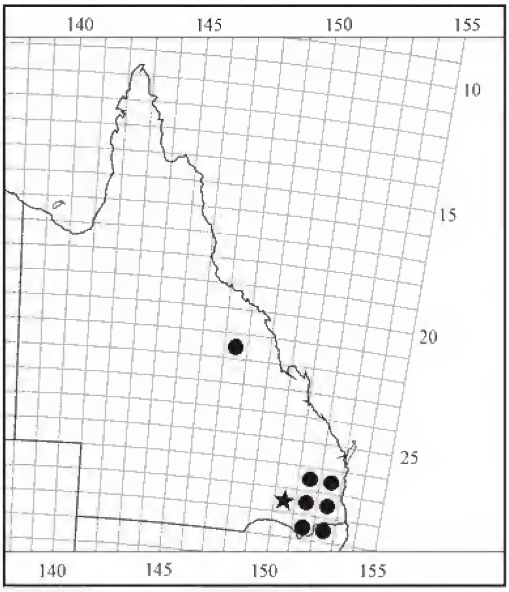
Map31. Distribution of *Solanum elaeagnifolium* ▲, and *S. longissimum* ★.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Vanguerieae A.Rich. ex Dum. (Rubiaceae) in Australia, 3.

Psydrax Gaertn.

Sally T. Reynolds and Rodney J.F. Henderson

Summary

Reynolds, S.T. & Henderson, R.J.F. (2004). Vanguerieae A.Rich. ex Dum. (Rubiaceae) in Australia, 3. *Psydrax* Gaertn. *Austrobaileya* 6(4): 817–889. The genus *Psydrax* Gaertn. (Rubiaceae, Vanguerieae), as it occurs in Australia, is revised. Several species of this genus have previously been included in *Canthium* Lam. but are now considered distinct from that genus. Of the twenty two Australian species currently recognised as belonging to *Psydrax*, thirteen are described here as new, namely *Psydrax ammophila* S.T.Reynolds & R.J.F.Hend., *P. banksii* S.T.Reynolds & R.J.F.Hend., *P. forsteri* S.T.Reynolds & R.J.F.Hend., *P. johnsonii* S.T.Reynolds & R.J.F.Hend., *P. laxiflorens* S.T.Reynolds & R.J.F.Hend., *P. lepida* S.T.Reynolds & R.J.F.Hend., *P. longipes* S.T.Reynolds & R.J.F.Hend., *P. pallida* S.T.Reynolds & R.J.F.Hend., *P. paludosa* S.T.Reynolds & R.J.F.Hend., *P. pendulina* S.T.Reynolds & R.J.F.Hend., *P. rigidula* S.T.Reynolds & R.J.F.Hend., *P. saligna* S.T.Reynolds & R.J.F.Hend. and *P. tropic*a S.T.Reynolds & R.J.F.Hend. New combinations are made for six of the other nine species, namely *Psydrax attenuata* (Benth.) S.T.Reynolds & R.J.F.Hend., *P. graciliflora* (Merr. & L.M.Perry) S.T.Reynolds & R.J.F.Hend., *P. latifolia* (F.Muell. ex Benth.) S.T.Reynolds & R.J.F.Hend., *P. oleifolia* (Hook.f.) S.T.Reynolds & R.J.F.Hend., *P. reticulata* (C.T.White) S.T.Reynolds & R.J.F.Hend. and *P. suaveolens* (S.Moore) S.T.Reynolds & R.J.F.Hend., while *P. montigena* S.T.Reynolds & R.J.F.Hend. is provided as a new name for the plant previously known as *Ixora orophila* C.T.White, which belongs in *Psydrax* as well. New infraspecific taxa recognised here are *Psydrax attenuata* var. *myrmecophila* S.T.Reynolds & R.J.F.Hend. with *Psydrax attenuata* forma *myrmecophila* S.T.Reynolds & R.J.F.Hend. and *P. attenuata* forma *megalantha* S.T.Reynolds & R.J.F.Hend., *P. attenuata* var. *tenella* S.T.Reynolds & R.J.F.Hend., *P. lamprophylla* forma *latissima* S.T.Reynolds & R.J.F.Hend., *P. odorata* subsp. *arnhemica* S.T.Reynolds & R.J.F.Hend., *P. odorata* subsp. *australiana* S.T.Reynolds & R.J.F.Hend., with *P. odorata* forma *australiana* S.T.Reynolds & R.J.F.Hend., *P. odorata* forma *foveolata* S.T.Reynolds & R.J.F.Hend. and *P. odorata* forma *subnitida* S.T.Reynolds & R.J.F.Hend., and *P. saligna* forma *filiformis* S.T.Reynolds & R.J.F.Hend. *Canthium buxifolium* Benth. is reduced to a subspecies of *Psydrax odorata* (Forst.f.) A.C.Sm. & S.P.Darwin containing *P. odorata* forma *buxifolia* (Benth.) S.T.Reynolds & R.J.F.Hend. and *P. odorata* forma *parviflorifra* S.T.Reynolds & R.J.F.Hend., and *Canthium lineare* E.Pritz. is accepted as conspecific with *Psydrax suaveolens* (S.Moore) S.T.Reynolds & R.J.F.Hend. Lectotypes for *Canthium attenuatum* Benth. and *Canthium lamprophyllum* F.Muell., basionyms for *Psydrax attenuata* (Benth.) S.T.Reynolds & R.J.F.Hend. and *P. lamprophylla* (F.Muell.) Bridson respectively, are designated. Keys to the species and infraspecific taxa, distributional maps and illustrations of some of the species are provided. A list of currently accepted names of Australian taxa previously considered to belong in *Canthium* Lam. or *Plectronia* L., is given in Supplement A. New combinations are made in Appendix 1. for two related species occurring in New Guinea (but not in Australia) considered to belong in *Psydrax*, namely *Psydrax cymigera* (Valeton) S.T.Reynolds & R.J.F.Hend. and *P. suborbicularis* (C.T.White) S.T.Reynolds & R.J.F.Hend.

Key words: *Rubiaceae*, *Vanguerieae*, *Psydrax*, Australian flora, taxonomy, nomenclature

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Introduction

As stated previously (Reynolds & Henderson 1999, 2001), taxa of *Psydrax* Gaertn. and *Cyclophyllum* Hook.f., together with those of *Everistia* S.T.Reynolds & R.J.F.Hend., have, until comparatively recent times, been included in *Canthium* Lam. Following critical studies from the 1960s evaluating the genus *Canthium* in Africa, recognition of some of the subordinate taxa previously included in it as distinct genera has resulted. Cuparon (1969) proposed that many species of *Canthium* from Africa, Madagascar and Asia be transferred to *Psydrax* and this led Bridson (1985) to reinstate *Psydrax* and include in it African species previously included in *Canthium* and one from Australian she named *Psydrax lamprophylla* (F.Muell.) Bridson.

Most of the Australian species previously included in *Canthium* are referrable to *Psydrax*. In this country, species of this latter genus are

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very complex and most of them are difficult to delimit because they have similar flowers and fruits, and the leaves, which are used to distinguish most species, are very variable and sometimes vary on the one branchlet. Moreover, most species are poorly known, poorly represented by herbarium material or represented in herbaria by incomplete material, and specimens exist which appear to represent intergrades between them.

Three of the taxa Bentham (1867) accepted as species of *Canthium*, and dealt with under the names *C. attenuatum, C. lucidum* and *C. oleifolium*, were each found to contain more than one species. Some of these species were undescribed while duplicates of the one collection of others were found filed under different species names in various herbaria. Moreover, it was discovered that the application of *C. attenuatum* and *C. lamprophyllum* had been inconsistent from the time the species were described. Examination of the syntypes of *C. attenuatum* and *C. lamprophyllum* showed that in both cases they represent more than one taxon at species rank. This is discussed more fully under the relevant *Psydrax* species below. *Canthium attenuatum* had also been confused with *C. oleifolium*, probably because the species concerned are morphologically very similar and their protologue descriptions are scanty and not clearly diagnostic. Bentham (1867) added to the confusion when he cited a Ferdinand Mueller collection from the ‘Burdekin river’ (in Queensland) for both these species (once as a syntype of *Canthium attenuatum* Benth.). Consequently, matching specimens had been filed under either of these names in various herbaria. This had the effect of making the species concerned seem very variable and difficult to delimit. Moreover, although Bentham considered certain Australian specimens he included under the name *Canthium lucidum* (= *Psydrax odorata* in this paper) to be conspecific with those from the Pacific Islands with this name, Merrill & Perry (1945) and Bridson (1985) considered the Australian ones specifically distinct from those from the Pacific Islands and referable to *Canthium lamprophyllum* F.Muell. (former) or *Psydrax lamprophylla* (F.Muell.) Bridson (latter). We accept, in part at least, Merrill’s, Perry’s and Bridson’s point of view that two species, not one as Bentham thought, are involved. However, we have found that both these species actually do occur in Australia.

This confusion in the nomenclature and taxonomy of these species, especially regarding the variability allowed in Australian specimens previously filed under the name *Canthium odoratum* in herbaria, began when Bentham (1867) combined *Canthium lamprophyllum* F.Muell. under *C. lucidum*. This was because the former, as Bentham conceived it, actually comprised two distinct taxa one of which is *Psydrax odorata* and the other is *P. lamprophylla* (F.Muell.)Bridson as delimited in this revision (see under *P. odorata* below).

Although the previous confusion in relation to *P. odorata* and most other *Psydrax* species in Australia has been clarified, and once-undescribed taxa allied to *P. odorata, P. attenuata* and *P. oleifolia* have been described (in this paper), many species still remain poorly known and specimens which cannot satisfactorily be placed in the taxa recognised here also exist. More collections of these species, especially of specimens with flowers, are needed to be made and more field studies undertaken before their affinities or dissimilarities can be fully understood. The variation accepted for some of the species recognised here is sometimes limited, mainly because they are insufficiently known, so their status may change as more material and more field observations become available.

Because most species are similar and often difficult to delimit, study of a combination of characters is often necessary before specimens can be identified. For this reason, lists of diagnostic attributes and the taxa that possess them are provided below to assist in identification of mainly sterile material. In addition, species which are closely related are grouped together and secondary keys to separate them from other group members are provided.

As before (Reynolds & Henderson 2001), this study was based mostly on herbarium material, but measurements given for leaves, inflorescences, flowers and fruits are based on dried, fresh or spirit material. Some measurements, such as heights for shrubs/trees, rely on notes provided by the collector. In the list of specimens cited, only the herbaria from which specimens have been seen are recorded. These herbaria are indicated by acronyms following Holmgren *et al.*, 1990. State subdivisions (pastoral districts) are provided for Queensland collections only. The acronym 'dbh', used in the forestry industry sense for 'diameter at breast height' and provided by the collector with some specimens, is used in relation to the tree/ shrub trunk in some descriptions. The taxonomic concepts accepted here are those of the first author and result from her many years of detailed herbarium studies.

Taxonomy

Psydrax Gaertn., *Fruct.* 1: 125, t.26, f.2 (1788); from Greek *psudros*, wrong, and *pseudein*, to lie, an allusion to the 'knobbly' seeds found in this genus and the belief that pimples grow on a liar's tongue. **Type**: *Psydrax dicoccos* Gaertn.

Trees or shrubs; branches usually borne at right angles to the stem; branchlets occasionally spinescent. **Leaves** opposite or whorled, stipulate, petiolate; stipules interpetiolar, free or shortly confluent and sheathing at base, mostly triangular or lanceolate, keeled and attenuated into a folded lobe at apex (except in *P. lamprophylla*), persistent or sometimes caducous; blades entire, glabrous or hairy. **Inflorescences** axillary, pedunculate, of dichotomously branched cymes with bifurcate cymose branches, the flowers mostly secund on the rachis and usually with a comparatively long-stalked solitary (central) flower near forks of the dichotomous branches; bracts small, usually near the distal end of the main peduncle. **Flowers** usually bisexual, 4- or 5-merous, fragrant. Calyx tube short, obconical or broad ellipsoid, with limb short cupular, subtruncate or shallowly lobed with 4 or 5, usually minute lobes. Corolla white, cream or lemon yellow, with tube usually campanulate, glabrous abaxially and usually with a ring of retrorse hairs at throat adaxially; lobes as long as the tube, valvate in bud, erect, spreading or recurved in flower, elliptic-oblong or lanceolate, obtuse or acute, slightly incurved and ± hooded at apex. Stamens 4 or 5, inserted in throat of corolla tube; filaments comparatively short, slender, sometimes nearly obsolete; anthers exserted or ± included in corolla tube, oblongoid or ellipsoid, obtuse and mucronate at apex and often tailed at base, dorsifixed, extrorse. Disc annular, inconspicuous. Ovary 2-locular, with a solitary, ± pendulous ovule in each locule; style filiform, longer than corolla tube, usually much exserted; stigma attached to the style by its concave hollow base; stigmatic knob ovoid or oblongoid, usually bilobed at apex. **Fruit** a drupe, usually blackish coloured when dry, subglobose, ellipsoid or obovoid but laterally compressed, slightly fleshy; pyrenes 1 or 2 in each fruit, these usually thick and woody, slightly ellipsoid, broad ovoid or hemispherical, usually depressed distally, rugose or smooth externally, 1-seeded; seeds oblongoid, with testa membranous.

Distribution: 100 species in the Old World Tropics according to Mabberley (1997); 22 species in Australia.

Affinities: *Psydrax* is closely related to *Canthium* from which it was segregated by Cuparon (1969) primarily on the orientation of the cotyledons. In *Psydrax*, he accepted the cotyledons are aligned parallel to the ventral surface of the seed whereas in *Canthium* they are aligned perpendicular to the ventral face of the seed.

Cuparon provided additional diagnostic characters for each genus which Bridson, when reinstating *Psydrax* as a distinct genus, noted before providing more characteristics to distinguish this genus from *Canthium* (Bridson 1985, p.691). A synopsis of these is as follows.

Plants in habit erect small trees or shrubs, rarely scandent but never lianas; leaves usually restricted to new growth at the apex of stems; stipules with or without villous hairs adaxially; style equalling the corolla tube in length, shortly exceeding it or occasionally twice as long as it; stigmatic knob ± as long as wide, rarely longer; anthers partly or completely exserted from corolla tube, straight, never reflexed .... **Canthium**
Plants in habit erect tall trees or shrubs or lianas; leaves dispersed along stems or restricted to apices in a very few species; stipules never with fine hairs adaxially; style exceeding the corolla tube in length by about twice or often much more; stigmatic knob distinctly longer than wide; anthers fully exserted from corolla tube, reflexed or straight .... **Psydrax** (and **Keetia**, which is restricted to Africa)

Within the African species of *Psydrax*, Bridson recognised two subgenera namely *P.* subgen. *Psydrax* and *P.* subgen. *Phallaria* (Schum. & Thonn.)Bridson. Using her key, the Australian species are referrable to the former subgenus.

The Australian species of *Psydrax* agree morphologically with those from outside Australia, differing from them only in their erect or subpatent rarely reflexed corolla lobes and anthers, which are always reflexed in the African species (Bridson 1985, p.688, f.1; p.704, f.3; p.718, f.6; p.720, f.7), and by their spinescent branchlets or thorns on the branches of young plants in *P. oleifolia*.

***Notes*:** In the keys and descriptions that follow, the main peduncle is taken to be the main stalk of the whole inflorescence, and the central or solitary flower is the usually long-stalked solitary flower which is situated in/near the forks of the dichotomously branched cymes. The measurement of the style includes that of the stigma.

Key to species of *Psydrax* in Australia

1. Leaves whorled with 3–5 per node or opposite on the same branchlet, canescent or subglabrous; branchlets canescent; N NT & N QLD .... **1. P. paludosa**
Leaves opposite or clustered on brachyblasts; branchlets and leaves never canescent; hairs if present usually very fine and occurring on young parts and inflorescence axes only 2

2. Leaf blades linear or narrow elliptic, 2.5–4.0 (–5.5) mm wide, with margins recurved or revolute; central Australia (WA, NT & SA) .... **3. P. suaveolens**
Leaf blades variously shaped, usually more than 5.0 mm wide, with margins flat or rarely recurved 3

3. Leaves usually more than 10 cm long 4
Leaves usually less than 10 cm long 9

4. Leaf blades broad elliptic or elliptic ovate, about twice as long as wide, up to 18 cm long and (3.1–) 4.0–8.7 cm wide; peduncles hairy 5
Leaf blades mostly narrow elliptic or lanceolate, 2–3 times as long as wide, rarely up to 18 cm long and 0.6–2.7 (–3.0) cm wide; peduncles glabrous 6

5. Stipules with a prominent keel and a folded lobe at apex; leaf blades with prominent, finely reticulate veins forming a closely arranged network; peduncles slender, sparsely hairy; NE QLD .... **9. P. tropica**
Stipules without a keel and an apical lobe; leaf blades with prominent or obscure, loosely arranged reticulate veins; peduncles robust, densely hairy; E QLD & NE NSW .... **7. P. lamprophylla**

6. Leaf blades 3–10 times as long as wide, 0.6–1.5 (–2.0) cm wide, obscurely veined; domatia present; inflorescences 5–15 (–22)-flowered; pedicel of solitary flower (5–) 10–18 mm long; branchlets dark green coloured; N NT & NE QLD .... **17. P. saligna**

   Leaf blades 3–4 times as long as wide, 1.4–3.0 cm wide, prominently veined; domatia present or absent; inflorescences more than 15-flowered; pedicel of solitary flower (3.5–) 8–10 mm long; branchlets reddish brown, brown or grey 7

7. Leaf blades narrow elliptic, subfalcate, 11.5–17.0 (–18.5) cm long, conspicuously nerved with lateral nerves ascending; domatia absent; young branchlets 4-angular, red coloured; N WA & N NT .... **18. P. pendulina**

   Leaf blades narrow elliptic or lanceolate, usually less than 11 cm long; lateral nerves oblique; domatia present or absent; young branchlets terete or slightly angular, brown, red brown or gray coloured 8

8. Leaf blades ± shiny on adaxial surface; domatia usually present on most leaves of a branchlet; flowers 5-merous; pedicels comparatively long (those of solitary flowers 8–17 mm long); bark of branchlets tessellated; NE QLD .... **16. P. lepida**

   Leaf blades dull or with a slight sheen on adaxial surface; domatia usually present only on some leaves of a branchlet, sometimes totally absent; flowers 4- or 5-merous; pedicels comparatively short (those of solitary flowers 8–11 mm long); bark of branchlets smooth; tropical WA, NT & QLD .. **15. P. attenuata**

9. Leaf blades up to twice as long as broad, with conspicuous raised nerves and close secondary reticulate venation (especially in dried specimens); main lateral nerves in (3 or) 4–8 pairs 10

   Leaf blades not with the above set of characters, broad or narrow, with lateral nerves and reticulate venation prominent or obscure, or veins absent; main lateral nerves in 1–4 (–6) pairs 12

10. Leaves with petiole 0.2–0.3 cm long; base of blade usually narrow and attenuate into the petiole; domatia usually present on leaves; N QLD .... **14. P. pallida**

    Leaves with petiole 0.2–1.3 cm long; base of blade usually subcordate, truncate or obtuse; domatia present or absent on leaves 11

11. Domatia absent on leaves; leaf blades broad elliptic or ovate or ± suborbicular, dull, glabrous, smooth or scrabridulous; petioles 0.2–1.2 cm long; arid WA, NT, SA, SW QLD & NW NSW .... **11. P. latifolia**

    Domatia usually present on leaves; leaf blades obovate or broad elliptic, shiny on adaxial surface, glabrous, smooth; petioles 0.2–0.6 cm long; Cape York, QLD .... **13. P. reticulata**

12. Fruits obovoid, 1.3–2.0 cm long × 0.8–1.1 cm wide 13

    Fruits obovoid or ellipsoid, 0.4–1.0 cm long × 0.3–0.9 cm wide 14

13. Inflorescences on slender peduncles 0.3–1.6 cm long; branching lax; branches ending in 3–7-flowered cymules; flowers 5-merous; leaf blades 6.0–9.0 cm long × 3.0–6.0 cm wide, shiny on adaxial surface; domatia present on leaves, conspicuous; fruits 1.3–1.5 cm long × 0.8–1.0 cm wide; NE QLD .... **8. P. laxiflorens**

    Inflorescence on long, stout, ± erect peduncles 2.0–6.0 cm long; branches and pedicels comparatively robust when dry; terminal cymes 8–12-flowered; flowers 4-merous; leaf blades usually 3.6–6.6 cm long × 1.5–3.3 cm wide, dull on adaxial surface; domatia on leaves small and inconspicuous or absent; fruits 1.5–2.0 cm long × 0.9–1.1 cm wide; NE QLD .... **5. P. montigena**

14. Branchlets and peduncles finely hairy 15
Branchlets and peduncles glabrous 20

15. Leaves usually more than 5.0 cm long 16
Leaves usually less than 5.0 cm long 17

16. Leaf blades narrow elliptic or sublanceolate, 0.8–1.8 cm wide, dull on adaxial surface; reticulate veins inconspicuous; domatia absent; central WA ..... **4. P. rigidula**
Leaf blades elliptic, elliptic-ovate or subobovate, (2.2–) 3.0–4.4 (–5.2) cm wide, usually very glossy on adaxial surface; reticulate veins apparent; domatia usually present; N WA, N NT, E QLD & NE NSW .... **6. P. odorata**

17. Domatia present on leaves, prominent; leaf blades narrow elliptic or elliptic, 2.6–4.5 cm long × 0.7–2.0 cm wide, dull on adaxial surface; lateral nerves indistinct; E QLD .... **21. P. johnsonii**
Domatia absent from leaves or if present obscure; leaf blades elliptic, narrow elliptic, suborbicular or obovate, 0.8–5.0 cm long × 0.4–3.0 cm wide, usually shiny on adaxial surface; lateral nerves distinct 18

18. Inflorescences 5–21-flowered, comparatively small, slender; main peduncles slender, 0.15–1.0 cm long; corolla 4.5–5.5 mm long, ± chartaceous; leaf blades elliptic, (0.8–) 2.2–4.6 cm long × (0.4–) 1.0–1.8 cm wide, rarely more, slightly shiny on adaxial surface; NE QLD & PNG ... **2. P. graciliflora**
Inflorescences usually more than 21-flowered; main peduncles slender or stout, (0.3–) 0.8–4.6 cm long; corolla 4.0–7.5 mm long, chartaceous or fleshy; leaf blades elliptic or obovate, 1.5–5.0 cm long × 0.9–3.0 cm wide , usually very glossy on adaxial surface 19

19. Leaf blades obovate, 3.2–5.0 cm long × 1.6–3.0 cm wide, rarely more; primary veins and secondary, reticulate veins prominent; inflorescence with main peduncles 1.5–4.6 cm long, slender; corolla 6.0–7.5 mm long, chartaceous, drying straw coloured; corolla tube cylindrical; Cape York, QLD .... **10. P. banksii**
Leaf blades elliptic or suborbicular, 1.5–5.0 cm long × 0.6–2.5 cm wide; primary veins prominent; secondary veins obscure; inflorescence with main peduncles (0.3–) 0.8–2.0 cm long, stout or slender; corolla 4.0–5.0 mm long, fleshy, drying brown; corolla tube broad campanulate; N WA, N NT, E QLD & NE NSW .... **6. P. odorata**

20. Leaf blades 2.0–2.8 cm long × 1.1–1.3 cm wide; inflorescences 5–17-flowered; petioles and peduncles 0.2–0.4 cm long; central & NW QLD .. **22. P. forsteri**
Leaf blades more than 3.0 cm long and 1.3 cm wide; inflorescences more than 17-flowered; petioles and peduncles usually more than 0.4 cm long 21

21. Domatia present on leaf blades, prominent 22
Domatia absent from leaf blades or if present inconspicuous 24

22. Leaf blades 1.4–4.4 cm wide, usually up to twice as long as wide, mostly very glossy on adaxial surface; flowers usually crowded on the branches of the inflorescence; pedicels stout, comparatively short, those on branches of the cyme almost obsolete; flowers mostly 4-merous, corolla fleshy; N WA, N NT, E QLD & NE NSW .... **6. P. odorata**
Leaf blades 0.6–2.7 (–3.0) cm wide, usually more than 3 times as long as wide, dull or slightly shiny on adaxial surface; flowers loosely arranged along branches of the inflorescence; pedicels comparatively long and slender; flowers mostly 5-merous, corolla chartaceous 23

23. Leaf blades 0.6–1.5 (–2.0) cm wide, (3–) 4–10 times as long as wide; nerves and veins usually indistinct; inflorescences 5–15 (–22)-flowered, branched once only; branchlets dark green; N NT & NE & central QLD .... **17. P. saligna**
Leaf blades 1.0–2.7 (–3.0) cm wide, up to 4 times as long as wide; nerves and veins prominent; inflorescences (8–) 13–41-flowered, usually branched more than once; branchlets brown, reddish brown or grey; tropical WA, NT & QLD .... **15. P. attenuata**

24. Leaf blades (0.7–) 1.7–2.4 (–3.3) cm wide, concolorous, with obscure or distinct nerves; reticulate veins and domatia very rarely present; inflorescences usually compact, the flowers closely arranged on branches; S QLD & N NSW .... **19. P. oleifolia**
Leaf blades (1.6–) 2.4–4.8 cm wide, somewhat discolourous; nerves and reticulate veins prominent; domatia usually present on some leaves of a branchlet; inflorescences usually open, the flowers loosely arranged on branches 25

25. Leaf blades to 4.8 cm wide, with 3–6 pairs of conspicuous lateral nerves; flowers mostly 4-merous; corolla 5.0–6.5 mm long; pedicels comparatively short, that of solitary flowers 0.2–0.35 cm long; young branchlets usually stout, reddish brown coloured; central Australia (WA, NT & SA) .... **12. P. ammophila**
Leaf blades 1.0–3.0 (–4.0) cm wide, with 2 or 3 pairs of prominent lateral nerves; flowers 4- or 5-merous; corolla 6.0–11.0 mm long; pedicels comparatively long, that of solitary flowers (0.3–) 0.5–1.0 cm long; young branchlets slender, reddish brown, brown or grayish coloured 26

26. Petioles (1.2–) 2.0–3.5 cm long; leaf blades 2.6–4.0 cm wide, rarely less, up to twice as long as wide; corolla 7.5–11.0 mm long; pedicel of solitary flowers (0.3–) 0.5–0.7 cm long; branchlets whitish coloured, or pale grey mottled with white; central & SE QLD .... **20. P. longipes**
Petioles 0.5–2.2 cm long; leaf blades 1.6–2.7 (–3.0) cm wide, 3–4 times as long as wide; corolla 5.5–8.0 mm long; pedicel of solitary flowers (0.5–) 0.8–1.0 cm long; branchlets brown, yellowish brown, reddish brown or grayish coloured; tropical WA, NT & QLD .... **15. P. attenuata**

A conspectus of some diagnostic attributes of *Psydrax* in Australia

Leaves usually in whorls and plants usually canescent: *P. paludosa*

Leaf blades linear with revolute or recurved margins: *P. suaveolens*

Leaf blades comparatively large, (8.5–) 10.5– 20 cm long; stipules without a keel or an apical lobe: *P. lamprophylla*

Leaf blades comparatively small, 0.9–8.3 (–9.3) cm long: *P. ammophila*, *P. banksii*, *P. forsteri*, *P. graciliflora*, *P. odorata*, *P. oleifolia*

Both leaf blades and inflorescences comparatively small (1.0–6.0 cm long): *P. ammophila*, *P. forsteri*, *P. graciliflora*, *P. odorata*

Leaf blades shiny or exceedingly glossy on adaxial surface: *P. banksii*, *P. lamprophylla*, *P. laxiflorens*, *P. lepida*, *P. odorata*, *P. tropica*

Leaf blades with a slight sheen on adaxial surface: *P. attenuata*, *P. johnsonii*, *P. lepida*, *P. montigena*, *P. odorata*, *P. saligna*

Leaf blades dull on adaxial surface: *P. ammophila*, *P. attenuata*, *P. johnsonii*, *P. oleifolia*, *P. rigidula*, *P. saligna*

Leaf blades concolorous: *P. oleifolia*

Leaf blades comparatively broad, less than 4 times as long as wide, with reticulate venation conspicuous: *P. latifolia*, *P. pallida*, *P. reticulata*, *P. tropica*

Leaf blades comparatively broad, less than 4 times as long as wide, with reticulate venation inconspicuous: *P. ammophila*

Leaf blades comparatively narrow, 4–10 times as long as wide: *P. attenuata*, *P. lepida*, *P. pendulina*, *P. saligna*

Leaves, branchlets and peduncles exceedingly stout in dried specimens: *P. montigena*

Domatia on leaves mostly prominent: *P. attenuata*, *P. johnsonii*, *P. lamprophylla*, *P. laxiflorens*, *P. lepida*, *P. montigena*, *P. odorata*, *P. pallida*, *P. reticulata*, *P. saligna*

Domatia on leaves mostly small and obscure: *P. ammophila*, *P. attenuata*, *P. banksii*, *P. longipes*, *P. montigena*, *P. tropica*

Domatia absent from leaves: *P. ammophila*, *P. attenuata*, *P. odorata*, *P. forsteri*, *P. latifolia*, *P. longipes*, *P. oleifolia*, *P. pendulina*, *P. rigidula*

Species Groups

Although species such as *Psydrax paludosa*, *P. suaveolens*, *P. lamprophylla*, *P. montigena* and *P. graciliflora* are very distinctive and readily recognisable as indicated in the key and conspectus above, others belong to groups of related somewhat similar species and are not so easy to distinguish. These groups are as follows.

(a) The ***Psydrax odorata*** group:

Psydrax odorata and its related species *P. banksii, P. lamprophylla, P. laxiflorens* and *P. tropica* are characterised by their glossy, coriaceous leaf blades with distinct nerves and veins and usually prominent domatia, their usually large, many-flowered inflorescences with short and stout or slender pedicels, and their flowers with fleshy or coriaceous corollas. These species may be distinguished as follows.

1. Stipules neither keeled nor attenuated into a folded lobe at apex; leaf blades (8.5–) 10.5–18.0 (–20.0) cm long × (3.1–) 4.0–8.7 (–9.7) cm wide; main peduncles exceedingly robust, hairy . . . . **7. P. lamprophylla**
   Stipules keeled and attenuated into a folded lobe at apex; leaves and peduncles not with above set of characters 2

2. Fruits obovoid, 1.3–1.5 cm long × 0.8–1.0 cm wide; inflorescences exceedingly loosely branched, with long slender branches and scattered, mostly 3–7-flowered cymules; domatia present on the leaves, conspicuous . . . . **8. P. laxiflorens**
   Fruits obovoid or ellipsoid, 0.5–0.8 cm long × 0.3–0.9 cm wide; inflorescences more or less compact, usually with many-flowered short branches, the ultimate cymules mostly more than 7-flowered; domatia present or absent on leaves, prominent or obscure 3

3. Leaf blades 10.0–14.5 (–18.0) cm long × 5.2–7.0 (–8.0) cm wide, usually shortly acuminate or subcaudate at apex, with prominent reticulate veins fine and forming a closely arranged network; stipules usually broad ovate, acuminate, scarious along margins . . . . **9. P. tropica**
   Leaf blades 1.5–8.3 (–9.2) cm long × 0.6–4.2 (–5.2) cm wide, obtuse, rounded or subacute at apex, with veins if visible, usually loosely reticulate; stipules ovate, with a long or short apical lobe, coriaceous 4

4. Leaf blades elliptic, elliptic-ovate, subrhombic or narrow elliptic, 5.0–9.3 cm long × 2.5–5.2 cm wide, rarely smaller; domatia usually prominent . . . . . . **6. P. odorata**
   Leaf blades obovate, elliptic, suborbicular or narrow elliptic, 1.5–5.0 cm long × 0.6–2.5 (–3.0) cm wide, rarely larger; domatia prominent or obscure, or absent 5

5. Leaf blades obovate or subelliptic, rounded at apex, narrowed into petiole proximally; inflorescence on long slender stalks 1.5–4.6 cm long; pedicels slender; corolla scarious, tube narrow campanulate . . . . **10. P. banksii**
   Leaf blades elliptic, narrow elliptic or suborbicular, obtuse or subacute at apex and base; inflorescence on stout or slender peduncles 0.3–2.0 cm long; pedicels usually stout and short, sometimes almost obsolete; corolla fleshy, tube broad campanulate . . . . **6. P. odorata**

(b) The ***Psydrax latifolia*** group:

Psydrax latifolia and its related species *P. ammophila, P. pallida* and *P. reticulata* are characterised by broad, usually thick, rigid, conspicuously nerved and reticulate veined leaf blades especially in dried leaves. These species may be distinguished as follows.

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1. Petioles 2.0–3.0 cm long; leaf blade base subacute or acute and attenuate into the petiole; lateral nerves in 3–5 pairs; domatia present . . . . **14. P. pallida**
   Petioles 0.2–1.3 cm long; leaf blade base broad obtuse, truncate, subcordate or rounded though sometimes subacute and attenuate into the petiole; lateral nerves in 4–9 pairs; domatia present or absent 2

2. Petioles 0.2–0.6 cm long; leaf blades obovate or broad elliptic, slightly shiny on adaxial surface; domatia usually present . . . . **13. P. reticulata**
   Petioles (0.2–) 0.5–1.3 cm long; leaf blades elliptic, broad ovate or suborbicular, dull on adaxial surface; domatia absent or occasionally present 3

3. Domatia absent on leaves; leaf blades (3.0–) 4.2–6.0 (–8.7) cm wide, with apex slightly rounded or truncate and base subcordate or obtuse; lateral nerves in (4–) 5–9 pairs; reticulate veins prominent, usually closely arranged, raised in dried specimens, usually visible on abaxial surface . . . . . **11. P. latifolia**
   Domatia present on some leaves of a branchlet or absent; leaf blades 1.2–3.5 (–4.8) cm wide, with apex and base obtuse or subacute; lateral nerves in (3–) 4–6 pairs; reticulate veins obscure, openly arranged, usually not visible on abaxial surface . . . . **12. P. ammophila**

(c) The ***Psydrax attenuata*** group:

Psydrax attenuata and its related species *P. lepida, P. pendulina* and *P. saligna* are characterised by narrow elliptic, lanceolate or elliptic leaf blades which are usually provided with domatia (though domatia are absent in *P. pendulina* and sometimes in *P. attenuata*) and prominent oblique ascending nerves (which are sometimes obscure in *P. saligna*), open, laxly branched inflorescences and chartaceous 4- or 5-merous flowers on long slender pedicels. These species may be distinguished as follows.

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1. Domatia present on all leaves or only on one or two leaves on the one branchlet 2
   Domatia absent on leaves 4

2. Leaf blades 0.6–1.8 cm wide, 4–10 times as long as wide; nerves distinct or indistinct; veins indistinct; inflorescences comparatively small, 5–15 (–22)-flowered; branchlets dark reddish brown or blackish grey coloured . . . **17. P. saligna**
   Leaf blades 1.0–3.0 (–4.2) cm wide, usually 3 to 4 times as long as wide; nerves and veins distinct; inflorescences comparatively large, to 50-flowered; branchlets reddish-brown, brown or greyish coloured 3

3. Domatia usually present on all the leaves of a branchlet; leaf blades shiny on adaxial surface; peduncle of inflorescence 1.0–1.5 cm long; flowers 5-merous, densely hairy at mouth of corolla tube; pedicel of solitary flowers 0.8–1.7 cm long . . . . **16. P. lepida**
   Domatia rarely present on all the leaves of a branchlet; leaf blades dull on adaxial surface; peduncle of inflorescence 0.3–0.6 cm long; flowers 4- or 5-merous, sparsely hairy at mouth of corolla tube; pedicel of solitary flowers (0.35–) 0.8–1.1 cm long . . . . **15. P. attenuata**

4. Leaf blades usually 11.0 to 18.5 cm long, more than 5 times as long as wide, usually thin coriaceous; lateral nerves conspicuous, exceedingly oblique; young branchlets quadrangular distally, reddish coloured . . . . . . **18. P. pendulina**
   Leaf blades usually less than 11.0 cm long, about 3–4 times as long as wide, thick coriaceous; lateral nerves prominent, oblique or exceedingly oblique; young branchlets terete or slightly angular distally, greyish or brownish coloured . . . . **15. P. attenuata**

(d) The ***Psydrax oleifolia*** group:

Psydrax oleifolia and its related species *P. forsteri, P. johnsonii* and *P. longipes* are characterised by dull or slightly shiny thick leaf blades with obscure or conspicuous nerves, with or without reticulate veins and usually without domatia (though domatia are present in *P. johnsonii* and sometimes in *P. longipes*), and usually 4-merous flowers (though 5-merous flowers occur in *P. forsteri* and sometimes in *P. longipes*). These species may be distinguished as follows.

1. Axes of young branchlets and inflorescences hairy; domatia present on leaves, prominent . . . . **21. P. johnsonii**
   Axes of young branchlets and inflorescences glabrous; domatia absent on leaves or, if present, inconspicuous 2

2. Leaves and inflorescences comparatively small; leaf blades 2.0–2.8 cm long × 1.1–1.3 cm wide; inflorescences 5–17-flowered; peduncles 2–4 mm long . . . . **22. P. forsteri**
   Leaves and inflorescences usually comparatively large; leaf blades (3.5–) 5.5–10.0 cm long × (0.7–) 1.7–4.0 cm wide; inflorescences 15–39-flowered; peduncles usually longer than 4 mm 3

3. Petioles 0.6–1.2 cm long; leaf blades (0.7–) 1.7–2.4 (–3.3) cm wide, concolorous;domatia and reticulate veins usually absent; nerves obscure or distinct; inflorescences usually much smaller than leaves and compact; flowers with corolla 4.0–6.5 mm long; fruits 4.5–6.0 mm across . . . . **19. P. oleifolia**
   Petioles 1.2–2.5 (–3.5) cm long; leaf blades (1.7–) 2.6–4.0 cm wide, discolorous; domatia present on some leaves of a branchlet; nerves and reticulate veins distinct; inflorescences open; flowers with corolla 7.5–11.0 mm long; fruits (0.4–) 0.6–0.7 cm across . . . . **20. P. longipes**

1. Psydrax paludosa S.T.Reynolds & R.J.F.Hend., **sp. nov.** a speciebus Australiae omnibus ceteris generis foliis plerumque ternatis et oppositis et canescentibus differt. **Typus**: Queensland. Cook District: Weipa, track between Telegraph line and 20 Mile, S of Marmoss Creek, 12°41’S, 142°05’E, 4 January 1983, *A. Morton* AM1773 (holo: BRI; iso: MEL).

Canthium sp. (Weipa, A.Morton AM1773), S.T. Reynolds (1997, p.181), P.I. Forster & D.A. Halford (2002, p.174).

Canthium sp. (Wenlock River, J.R.Clarkson 8418+)*[1], S.T. Reynolds (1997, p.181).

Shrubs 2–8 m high, with branches horizontal; bark mottled; branchlets finely hairy or glabrous, dark reddish-brown, reddish coloured distally. **Leaves** whorled, with 3–5 leaves at each node, or opposite; stipules comparatively small, broad ovate with a short lobe at apex, hairy or glabrous abaxially, hairy at base adaxially; petioles 0.1–0.8 cm long; blades elliptic, narrow elliptic-subobovate or narrow obovate, (1.0–) 2.2–5.2 cm long × (0.4–) 1.2–1.7 cm wide, with apex obtuse and base acute or subacute, thin coriaceous; adaxial and abaxial surfaces finely white hairy or glabrous; lateral nerves consisting of 1 or 2 pairs, obscure, oblique to midrib and ascending distally, or absent; reticulate veins absent; domatia one on each side of midrib and obscure, or absent. **Inflorescences** 1.8–2.5 cm long × 1.8–2.5 cm wide, 8–30-flowered; peduncles hairy or subglabrous, the basal one 6.0–8.0 mm long with a pair of small ovate bracts at its distal end; axis branches 3.0–5.0 mm long. **Flowers** 4-merous; pedicel of solitary flowers 3.0–5.0 mm long, that of others 0.2–2.0 mm long; calyx 2.0–2.5 mm long, with tube campanulate and limb 4-denticulate; lobes ovate, 0.5–0.8 mm long × *c.*0.75 mm wide; corolla 3.5–7.0 mm long, cream or lemon yellow; tube inflated, ± campanulate, 1.5–3.5 mm long × 2.0–2.5 mm wide at top, densely hairy at throat; lobes elliptic, 2.0–4.5 mm long × *c.*1.5 mm wide, subacute or obtuse, erect or recurved; stamens exserted; filaments 1.5–2.0 mm long; anthers 1.5–2.0 mm long, erect; disc hairy; style (with stigma) 6.0–8.0 mm long; stigma ellipsoid, *c.*0.75 mm long, bifid at apex. **Fruits** (only immature ones seen) ellipsoid or obovoid, 1.0–1.2 cm long × 0.8–1.0 cm wide, smooth, exceedingly fleshy; pyrenes ellipsoid, smooth, thin, crustaceous; endosperm thick. **(Fig. 1)**

***Additional representative specimens*: Northern Territory.** Bing Bong Station (15°44'S, 136°20'E), Nov 1977, *Craven* 4694 (DNA). **Queensland.** Cook District: Archer River, 13°25'S, 142°10'E, Sep 1974, *Hyland* 7712 (BRI, QRS); ditto, Archer Bend, Sep 1974, *Tracey* 14355 (BRI, QRS); along road to Inkerman, from Burke Development Road, 16°24'S, 142°34'E, Jan 1987, *Dalliston* 52 (BRI); 4 km S of Dunbar Homestead, 16°04'S, 142°20'E, Jul 1987, *Dalliston* 18 (BRI); track to James Creek, 4 km N of Escott Homestead, 17°29'S, 139°14'E, Jul 1987, *Dalliston* 216 (BRI); 56 km W of Rokeby Homestead, 13°27'S, 142°16'E, Jul 1988, *Dalliston* 531 (BRI); 8.8 km S of Wenlock River on Peninsula Development Road, 12°31'S, 142°39'E, Apr 1990, *Clarkson* 8418 & *Neldner* (BRI)*[1]; 2.4 km W of Lydia Creek on Mission River Road, 12°33'S, 142°34'E, Apr 1990, *Clarkson* 8600 & *Neldner* (BRI)*[1]; Cape York, Edward River near Mitchell Downs, 14°46'S, 141°40'E, Apr 1990, *Taplin* CY26 (BRI); about 45 km due E of Kowanyama Aboriginal Community, 15°28'S, 142°13'E, Jun 1992, *Blackman* G33 (BRI).

***Distribution and habitat*:** Northern Australia from Arnhem Land, Northern Territory, to Cape York Peninsula, Queensland; usually in standing water on the edge of waterways and flooded drainage lines in *Eucalyptus tetrodonta* woodland and in swampy areas with *Melaleuca* species. **(Map 1)**

***Diagnostic attributes*:** *Psydrax paludosa* is readily distinguishable from other Australian species of this genus by its whorled (with usually 3–5 leaves at each node) and opposite leaves on the same branchlet, canescent branchlets and leaf blades, comparatively small inflorescences, and conspicuously fleshy fruits with thin crustaceous, smooth-surfaced pyrenes.

***Notes*:** Although most of the specimens seen have the typical canescent branchlets, a form with glabrous or subglabrous branchlets (as represented by specimens marked *[1] above) also exists.

***Etymology*:** The specific epithet *paludosus*, Latin for 'marshy, swampy or boggy', refers to the usual habitat of this species.

2. Psydrax graciliflora (Merr. & L.M.Perry) S.T.Reynolds & R.J.F.Hend., **comb. nov.**; *Canthium graciliflorum* Merr. & L.M.Perry, *J. Arnold Arb.* 26: 230–231 (1945). **Type**: Papua New Guinea. Tarara, Wassi Kussa River, December 1936, *L.J. Brass* 8596 (holo: n.v.; iso: BRI, K).

Shrubs or small trees (1–) 2–8 (–10) m high; trunk 10–15 cm dbh, coppicing at base, fluted; bark whitish coloured; branchlets quadrangular and ridged distally, minutely hairy, dark greyish-brown, young ones often slightly zigzagged. **Leaves** opposite; stipules broad triangular, keeled, attenuated into a long, broad,

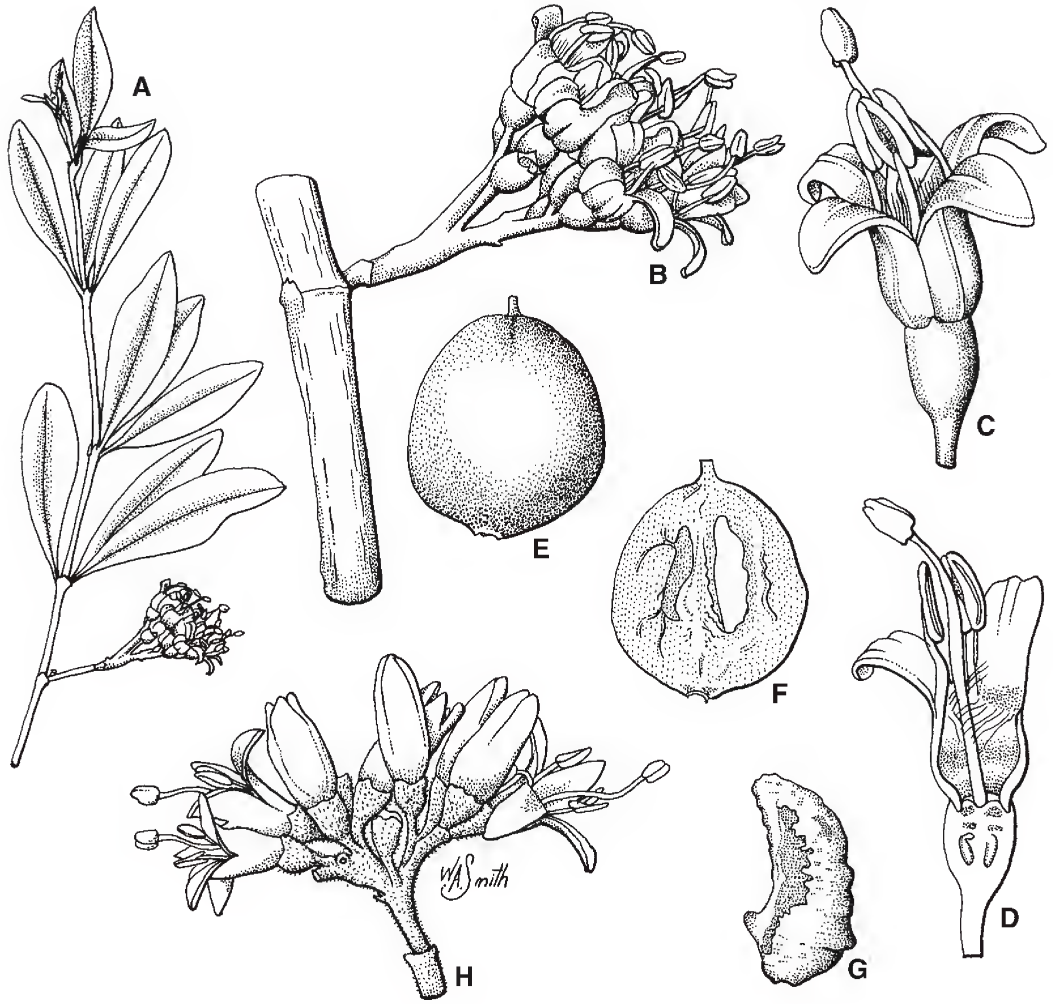

Fig. 1. ***Psydrax paludosa*** (typical form). A. flowering branch × 1. B. inflorescence × 3. C. flower × 6. D. LS of flower × 6. E. Fruit × 3. F. LS of fruit × 3. G. pyrene × 6. A–G, *Clarkson* 8600 & *Neldner* (BRI). ***Psydrax paludosa*** (hairy form). H. part of inflorescence × 3. H, *Morton* AM1773 (BRI).

lanceolate lobe or sometimes into a small and short lobe at apex, somewhat scarious, shiny; petioles (0.1–) 0.2–0.4 cm long, glabrous or sparsely hairy; blades elliptic or sometimes narrow elliptic, (0.9–) 2.2–4.6 (–5.2) cm long × (0.4–) 1.0–1.8 (–2.0) cm wide, with apex and base usually subacute, glabrous on both surfaces with adaxial surface bright green and slightly shiny, the abaxial one slightly darker and dull; lateral nerves in 3–5 pairs, slightly patent or suboblique and looping at margins, fine, obscure or absent on abaxial surface; domatia absent or rarely when present 1 or 2 on each leaf and inconspicuous. **Inflorescences** 1.2–1.4 cm long × 1.3–2.2 cm wide, 5–17 (–21)-flowered; peduncles and pedicels minutely hairy, terminating in 2 or 3 branched cymes, the main peduncle 1.5–10.0 mm long, with minute bracts at its distal end; axis branches 4.0–5.0 mm long, ultimate cymules usually 5-flowered. **Flowers** 4(or 5)-merous; pedicel of solitary flowers 4.5–7.0 mm long, that of others 2.0–5.0 mm long; calyx 1.75–2.0 mm long, with tube subturbinate and limb 4-denticulate; lobes ovate, 0.25–0.5 mm long × 0.75–1.0 mm wide; corolla 4.5–5.5 mm long, white or cream; tube campanulate, 1.0–1.75 mm long × *c.*1.5 mm wide at top, hairy at throat; lobes narrow elliptic, 3.5–4.5 mm long × 1.0–1.5 mm wide, obtuse, erect or ± spreading; stamens as long as the corolla lobes; filaments 1.5–2.0 mm long; anthers 2–3 mm long, erect, ± recurved at anthesis; style (with stigma) 4–6 mm long; stigma oblongoid, *c.*1.5 mm long, bilobed at apex. **Fruits** subglobose or broad ellipsoid, 3.0–4.5 mm long × 3.0–6.5 mm wide, black when ripe; pyrenes ellipsoid, slightly rugose.

Representative specimens**: Papua New Guinea:** Tarara, Wassi Kussa River, Dec 1936, *Brass* 8596 (BRI, K). **Australia: Queensland.** Cook District: Timber Reserve 14, Parish of Kesteven, 13°43'S, 143°19'E, Mar 1962, *Hyland* 11757 (BRI); Lankelly Creek, McIlwraith Range, Oct 1969, *Webb & Tracey* 9559 (BRI, QRS); Mt Tozer near Iron Range, 12°45'S, 143°12'E, Nov 1977, *Tracey* 14871 (BRI); near Lockerbie, 10°47'S, 142°28'E, Feb 1980, *Hyland* 10281 (BRI); Summit of Mt Tozer, 12°44'S, 143°12'E, Jun 1980, *Morton* AM847 (BRI); National Park Reserve 8, Parish of Weymouth, 12°37'S, 143°21'E, Mar 1982, *Hyland* 11739 (BRI); Endeavour River, 15°25'S, 145°15'E, Dec 1983, *Langford* s.n. (BRI, QRS); Crusher Creek, Moa Island, 10°15'S, 142°15'E, Apr 1987, *Budworth* 975 (BRI).

Distribution and habitat**:** South coast of Papua New Guinea to Cape York Peninsula, Australia, including Torres Strait Islands; on ranges, ridges, creek and riverbanks, in evergreen or semi-deciduous notophyll vine forests. (**Map 2** - Queensland only)

Diagnostic attributes**:** *Psydrax graciliflora* is characterised by small, thick, finely nerved, elliptic leaf blades and small, fragile inflorescences with small flowers on slender pedicels, hairy branchlets and inflorescences, and ± scarious stipules which are keeled and attenuated into a long broad (though sometimes short) lobe at the apex.

Notes**:** A specimen recorded under the name *Canthium* sp. (Altanmoui Range D.G.Fell+ DGF2702) by Reynolds (1997, p.180) and others previously filed under that name in BRI have small leaves but they probably represent distinct forms of this species. However, as they are sterile it is not possible to be certain of this. These specimens are as follows.

Queensland. Cook District: Altanmoui Range, Cape Melville National Park, 7 km E of Wakooka Outstation, 14°34'S, 144°26'E, Oct 1992, *Fell* DGF2702 & *Stanton* (BRI). North Kennedy District: northern end of Little Ramsay Bay, Hinchinbrook Island, 18°20'S, 146°19'E, Aug 1975, *Sharpe* 1678 (BRI); Mulligan Bay, Hinchinbrook Island, 18°27'S, 146°20'E, Jan 1987, *Godwin & Stanton* C3013 (BRI); tributary of Mulligan Creek, Hinchinbrook Island, 18°26'S, 146°19'E, Sep 1994, *Cumming* 13353 (BRI).

If correctly placed, the Cape Melville collection by Fell & Stanton has the smallest leaves seen for this species whereas the Hinchinbrook Island collections have smaller and narrower leaves than are usual for it. Moreover, *P. graciliflora* has sofar not definitely been collected from as far south as these latter specimens were.

3. Psydrax suaveolens (S.Moore) S.T.Reynolds & R.J.F.Hend., **comb. nov.**; *Canthium suaveolens* S.Moore, *J. Linn. Soc. Bot.* 34: 194 (July 1899). **Type**: Western Australia. Repperi juxta Mt Margaret, 1894–95, *S. Moore* s.n. (holo: BM).

Canthium lineare E.Pritz., *Feddes Repert.* 15(3): 359 (Dec 1918), *Plectronia linearis* (E.Pritz.) J.M.Black, *Trans. & Proc. Roy Soc. S. Aust.* 59: 261 (1935), **syn. nov. Type**: Northern Territory. Central Australia, Hermannsburg ad flumen Fincke, 1906–1908, *Strehlow* 88 (n.v.).

Slender shrubs 2–3.5 m high; bark smooth, light or bluish grey coloured; young parts and inflorescences hairy; branchlets greyish or reddish coloured, occasionally with a whitish bloom distally. **Leaves** opposite or sometimes clustered on brachyblasts; stipules ovate, slightly keeled, attenuated into a folded lobe at apex, with colleters present at the base adaxially; petioles 0.1–0.2 cm long; blades linear, very narrow elliptic or narrow oblong obcuneate, (2.1–) 4.0–6.2 cm long × 0.25–0.4 (–0.55) cm wide, with apex obtuse, base subacute and narrowing into the very short petiole, and margins revolute or recurved, rigid on drying; adaxial and abaxial surfaces glabrous; midrib deeply channelled above, raised below; nerves and reticulate venation not apparent. **Inflorescences** with main peduncles 2–5 mm long with minute bracts at its distal end, terminating in 2 branched cymes; axis branches *c.*2.0 mm long, cymules 2–5-flowered. **Flowers** 5-merous; pedicel of solitary flowers 3.5–5.0 mm long, of others 2.0–4.5 mm long; calyx 2.0–2.5 mm long, with tube cupular, flared to a 5-dentate limb; lobes ovate-acuminate or ovate; corolla 4.0–7.5 mm long, white or cream; tube ± cylindrical, 1.5–2.5 mm long × 2.0–2.5 mm wide, sparsely hairy at throat; lobes elliptic, 3.0–6.5 mm long × 2.0–2.5 mm wide, subacute, erect; stamens slightly exserted; filaments 1.5–2.5 mm long; anthers 2.0–3.0 mm long, erect or patent; disc shorter than the calyx limb, glabrous; style (with stigma) 7.0–10.0 mm long; stigma oblongoid, bifid at apex. **Fruits** transversely ellipsoid or subglobose, 5.0–6.0 mm long × 6.5–8.5 mm wide, 2-celled, black and shiny when ripe, fleshy and juicy; pyrenes exceedingly rugose on abaxial surface. **(Fig. 2A–2E)**

***Additional representative specimens*: Western Australia**. Rawlinson Range, S of Sladen Water (24°5-'S, 128°1-'E), Feb 1935, *Finlayson* s.n. (AD); 24 miles (*c*.38.4 km) East Blackstone Ranges (25°56'S, 128°08' E), Jun 1958, *Chippendale* 4524 (DNA, PERTH); 60 miles (*c*.96 km) N of Paynes Find, Apr 1960, *George* 710a (PERTH); Yerilla Station (29°28'S, 121°41'E), Aug 1985, *Burnside* s.n. (PERTH); 1.4 km W of No 17 Bore, Berwidgie Station, Jun 1988, *Cranfield* 6845 (PERTH); West Angelas, Dec 1995, *Janicke* Ub6 (PERTH). **Northern Territory**. Napperby, about 100 miles (*c*.160 km) NW of Alice Springs, 22°35'S, 132°45'E, Jan 1930, *Everist* 4194 (AD, BRI); 11 miles (*c*.17.6 km) W of Ayers Rock along Ayers Rock and Docker Creek road (25°20'S, 130°49'E), Jan 1969, *Maconochie* 650 (AD, CANB, DNA); CSIRO Mulga enclosure (23°28'S, 133°48'E), Dec 1971, *Latz* 1867 (DNA); MacDonnell Ranges, Nov 1885, *Schwarz* s.n. (MEL); Mt Windsor (23°50'S, 130°51'E), May 1988, *Leach* 1993 & *Latz* (DNA). **South Australia**. about 19 km W of Tallaringa Well, 28°51'S, 133°05'S, May 1964, *Lothian* 2746 (AD, BRI, DNA); Everard Ranges between Boundary Bore and Gap Well (27°05'S, 132°3-'E), Dec 1981, *Kalotas* 1003 (AD, DNA).

***Distribution and habitat*:** Central Australia from Barker and Rawlinson Ranges to south of Leonora, Western Australia, ranges near Alice Springs, Northern Territory (Haast's Bluff to Palm Valley Chalet), and northwestern plains of South Australia (Everard Ranges to west of Tallaringa Well); on top of scree slopes of foothills and on sandy plains, usually with Mulga (*Acacia aneura* F.Muell. ex Benth.: Mimosaceae) in grassland, on red to red-brown, sandy to sandy-clayey soils. **(Map 2)**

***Diagnostic attributes*:** *Psydrax suaveolens* is readily recognisable by its narrow, usually linear leaves with revolute or recurved margins. It is related to *P. rigidula* with which it shares the hairy young branchlets and hairy, few-flowered inflorescences with 5-merous flowers, but that species differs from *P. suaveolens* in its broader, distinctly nerved leaf blades with flat or slightly recurved margins. There are, however, occasional specimens which appear to be intergrades between the two.

***Uses*:** The fruits of this species are reported by certain collectors to be edible.

4. Psydrax rigidula S.T.Reynolds & R.J.F.Hend., **sp. nov.** aemulans *P. suaveolens* (S.Moore) S.T.Reynolds & R.J.F.Hend. cujus flores habet sed folii lamina latiore et plusminusve rigida, marginibus recurvis constructis differt. **Typus.** Western Australia. 6 miles (*c*.9.6 km) N of Meekatharra, 6 November 1968, *H. Demarz* D591 (holo: PERTH).

Small trees or shrubs 2–3 m high; bark smooth, purplish grey coloured; branchlets slightly quadrangular distally; young parts and inflorescence axes finely hairy, reddish coloured. **Leaves** opposite; stipules ovate, keeled, attenuated into a long folded lobe at apex; petioles 0.25–0.6 cm long; blades narrow sublanceolate or elliptic, 5.2–7.5 cm long × 0.8–1.8 cm wide, with apex subacute or obtuse, base subacute and attenuate into the petiole, and margins slightly recurved, coriaceous, drying coriaceous, yellowish coloured adaxially, dark green abaxially; midrib sunken adaxially, raised abaxially; lateral nerves in 4–7 pairs, oblique, ascending; reticulate venation not apparent; domatia absent. **Inflorescences** 1.5–2.3 cm long × 2.8–3.5 cm wide, 17–45-flowered; main peduncle 4.5–6.0 mm long, provided with minute bracts medially; branches 2.5–4.5 mm long; cymes 8–22-flowered. **Flowers** 5-merous; pedicel of solitary flowers 3.5–4.5 mm long, of others 2.5–3.0 mm long; calyx 2.5–3.0 mm long × 1.5–2.5 mm wide, with tube cupular, puberulous and limb 5-dentate, flared, puberulous, sometimes ciliolate; lobes ovate, *c*.0.5 mm long × 0.5 mm wide; corolla 6–7 mm long, white or cream; tube cylindrical, 2.0–3.5 mm long × 2.0–2.5 mm wide, sparsely hairy at throat; lobes elliptic to lanceolate, 4.0–5.5 mm long × 1.5–2.0 mm wide, obtuse or subacute, slightly hooded and papillose at apex; stamens exserted; filaments 1.5–2.5 mm long; anthers 2.0–3.0 mm long, erect or ± patent; disc shorter than calyx limb, glabrous; style (with stigma) 7–10 mm long. **Fruits** broad ellipsoid, 5.0–7.0 mm long × 7.0–9.0 mm wide; pyrenes hemispherical, exceedingly rugose (especially on the abaxial side). **(Fig. 2F–2J)**

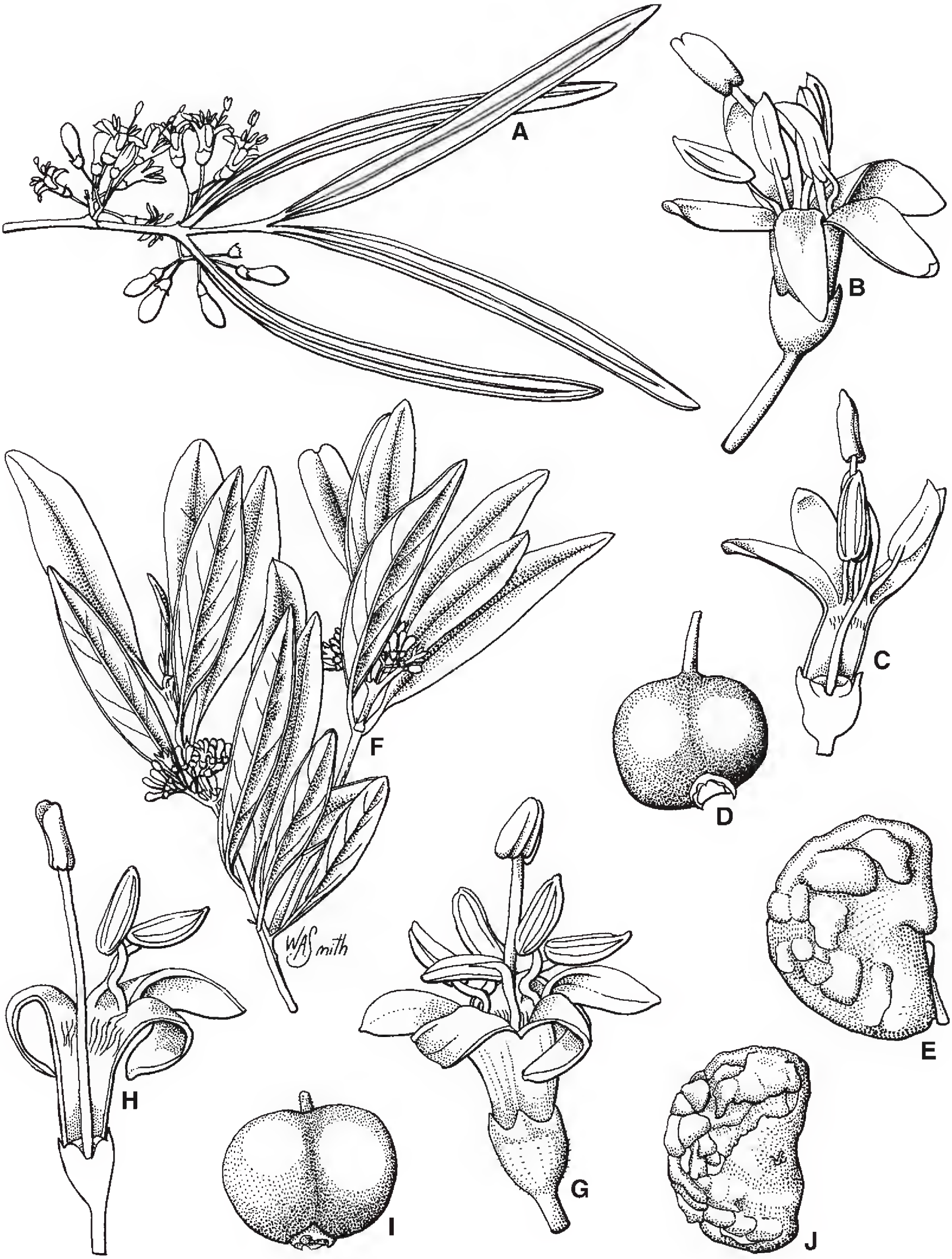

Fig. 2. ***Psydrax suaveolens***. A. flowering branch × 1. B. flower × 5. C. LS of flower × 5. D. fruit × 3. E. pyrene × 5. A–C, *Janicke* U6b (PERTH); D&E, *Symon* 9961 (AD). ***Psydrax rigidula***. F. flowering branch × 0.6. G. flower × 5. H. LS of flower × 5. I. fruit × 4. J. pyrene × 5. F–H, *Demarz* D591 (PERTH); I&J, *Gardner* & *Blackall* 122 (PERTH).

***Additional representative specimens*: Western Australia.** Kimberley, exact locality unknown, May 1874, *Forrest's Expedition* [MEL1538055] (MEL); N of Meekatharra, Jul 1931, *Gardner* s.n. (PERTH); Cue, between Mt Magnet and Meekatharra (27°27'S, 117°53'E), Jul 1931, *Gardner & Blackall* 122 (PERTH); Boolardy Station, Murchison River, May 1936, *Melville* 37 (K, PERTH); 483 miles (*c*.773 km) N of Meekatharra, Oct 1963, *Lullfitz* 2585 (PERTH); 10 miles (*c*.16 km) N of Callytharra, Oct 1972, *Demarz* 3968 (PERTH); 14 km SE of Leonora, Jul 1977, *Parker* 92 (PERTH); 2 km W of Midshinner Well, Milly Milly Station (25°48'S, 116°51'E), Apr 1986, *Cranfield* 5385 (PERTH).

***Distribution and habitat*:** Western Australia, from Mt Wendell to Warbuton and Robinson Ranges (between 21° to 30°S and 115° to 126°E); along water courses, dry creek beds, on lateritic soil. (**Map 3**)

***Diagnostic attributes*:** *Psydrax rigidula* is characterised by shortly stalked, thick, narrow, sublanceolate or elliptic leaf blades which dry a greenish yellow colour, and shortly stalked, comparatively small, hairy inflorescences with 5-merous flowers. This species is related to *P. suaveolens*, with which it has similar bark, leaf texture, inflorescence and flower attributes, but that species differs from *P. rigidula* by its narrow, linear leaf blades which usually have revolute margins.

***Uses*:** The leaves and fruits of *Psydrax rigidula* are reported by collectors to be edible to stock but the leaves are usually inaccessible to sheep.

***Etymology*:** The specific epithet *rigidulus*, Latin for 'somewhat rigid', refers to the more or less rigid leaves in this species.

5. Psydrax montigena S.T.Reynolds & R.J.F.Hend., **nom. nov.**; *Ixora orophila* C.T.White, *Proc. Roy. Soc. Qld* 53: 220 (1942), nom. illeg. non Bremek., *J. Bot. London* 75: 321 (1937). **Type**: Queensland. Cook District: Thornton Peak, 16°15'S, 145°25'E, alt. 4,500 feet, 14 December 1940, *H. Flecker* NQNC7110 (holo: BRI).

Canthium sp. (Thornton Peak H.Flecker NQNC7110), S.T. Reynolds (1997, p.181), P.I. Forster & D.A. Halford (2002, p.174).

Shrubs or small trees 2.5–12 m tall; trunk 10.0–18.3 cm dbh, usually buttressed; branchlets usually robust, ± angular distally, glabrous, lenticellate. **Leaves** opposite; stipules ovate, 4.0–6.0 mm long, keeled, attenuated into a long folded lobe at apex; petioles (0.2–) 0.4–0.7 cm long; blades elliptic, (3.6–) 4.5–6.6 (–7.2) cm long × (1.5–) 2.1–3.3 (–4.0) cm wide, with apex and base obtuse or apex shortly subacuminate, coriaceous, drying exceedingly thick; both adaxial and abaxial surfaces glabrous, the adaxial ones slightly glossy, the abaxial ones dull; midrib conspicuous on abaxial surfaces, drying paler than other parts of the blade; lateral nerves in 4–6 pairs, slender, obliquely arched from midrib; reticulate venation not apparent; domatia small, usually one on each side of midrib, sometimes absent. **Inflorescences** 6.5–8.0 cm long (including peduncle), 4.0–6.0 cm wide, 17–25-flowered; peduncles glabrous, the main one robust, more or less erect, 2.0–3.8 (–6.0) cm long; axis branches 0.8–1.2 cm long; cymes 8–12-flowered. **Flowers** 4-merous; pedicel of solitary flowers 6.0–9.0 mm long, of others 1.5–2.0 mm long; calyx 2.0–3.5 mm long, with tube ± urceolate and limb 4-denticulate; lobes ovate, *c*.0.5 mm long × 1.5 mm wide; corolla 5.0–9.0 mm long, white or cream; tube broad campanulate, 1.0–3.0 mm long, 2.0–3.5 mm wide at top, sparsely hairy at mouth; lobes elliptic to sublanceolate, 4.5–6.0 mm long × 1.5–2.5 mm wide, obtuse or subacute with apex incurved, fleshy, usually recurved; disc glabrous; stamens shorter than corolla lobes; filaments 1.5–2.0 mm long; anthers 3.0–3.5 mm long × 0.7–1.0 mm wide, exserted, erect; style (with stigma) 6.5–9.0 mm long, exserted; stigma 2.0–3.0 mm long. **Fruits** obovoid, 15.0–20.0 mm long × 9.0–11.0 mm wide, black when ripe; pyrenes exceedingly rugose.

***Additional representative specimens*: Queensland.** Cook District: Russell River, in 1892, *Johnson* [MEL1538182, MEL1538183] (MEL); N Mary Logging Area, Mt Lewis, Oct 1973, *Sanderson* 458 (QRS); Thornton Peak, Nov 1973, *Hyland* 7047 (BRI, K); Mt Hermet, Oct 1975, *Hyland* 3343 (BRI, K, QRS); Broken Nose, Mt Bartle Frere, Dec 1978, *Jago* 251 (QRS); Thornton Peak, Jan 1986, *Godwin* 2912 (BRI); Daintree National Park, Mt Sorrow track before razorback, 2.5 km W of Cape Tribulation, 16°04'S, 145°27'E, Dec 1997, *Forster* PIF21979, *Booth, Jago & Jensen* (BRI).

***Distribution and habitat*:** North Queensland, from Thornton Peak to Mt Bartle Frere; in montane rainforests bordering shrublands at altitudes of 1000–1500 m. (**Map 6**)

Diagnostic attributes**:** *Psydrax montigena* is readily distinguishable by its compact habit, robust branchlets, exceedingly thick leaves, long robust suberect peduncles, fleshy flowers and comparatively large obovoid fruits with very rugose pyrenes.

Notes**:** *Psydrax montigena* is a new name published here for the plant previously known as *Ixora orophila* C.T.White. White's name is illegitimate being a later homonym of Bremekamp's *Ixora orophila*, dating from 1937, which is applicable to a different species.

Etymology**:** The specific epithet *montigena*, Latin for 'mountain-born', refers to the habitat of this species.

6. Psydrax odorata (Forst.f.) A.C.Sm. & S.P.Darwin, *Fl. Vitiensis Nova* 4: 230 (1988); *Coffea odorata* Forst.f., *Fl. Ins. Austr. Prod.* 16 (1786); *Canthium odoratum* (Forst.f.) Seem., *Fl. Vitiensis* 132 (1866). **Type**: Vanuatu. Tanna Island, date unknown, *J.R. & G.Forster* s.n. (lecto: BM, fide A.C. Smith & S.P. Darwin, *op. cit.* p.232).

Canthium lucidum Hook. & Arn., *Bot. Beechey Voy.* 65 (1832), nom. illeg. non R.Br.; *Canthium beecheyi* Steud., *Nomen. Bot.* ed.2, 1: 275 (1841); *Plectronia hookeriana* Domin, *Biblioth. Bot.* 89: 622 (1929). Type: Gambier Islands. collector unknown (holo: K n.v., fide A.C. Smith & S.P. Darwin, *op. cit.* p.232).

Shrubs or small trees 2–12 m high, with branches usually at right angles to the stem; bark smooth or rough, dark or pale creamy grey, mottled with white; branchlets, petioles, young leaf blades and inflorescence axes with fine minute hairs or glabrous; branchlets usually slightly quadrangular and resinous distally, pale brown or greyish white, drying brownish coloured, lenticellate. **Leaves** opposite, very variable; stipules triangular, 3.0–8.0 mm long, keeled, abruptly contracted and attenuated into a long folded lobe at apex, with the lobe either conspicuous, ± foliaceous, to 9.0 mm long or narrow and acuminate, hairy or glabrous, with colleters occasionally present at base adaxially; petioles 0.1–1.1 cm long; blades elliptic, elliptic-oblong, ovate-elliptic, suborbicular, narrow elliptic, slightly rhombic or subobovate, 1.5–8.3 (–9.3) cm long × 0.6–4.4 (–5.6) cm wide, with apex obtuse, subacute or shortly, usually bluntly, acuminate, and base obtuse or subacute and usually decurrent into petiole, thin or thick coriaceous; adaxial and abaxial surfaces glabrous, or hairy proximally along the midrib on the abaxial surfaces on young leaves; adaxial surfaces exceedingly glossy, green or ± bluish green with nerves pale green, or slightly matt then yellowish green with whitish coloured nerves, and abaxial surfaces pale green and dull, both drying brown with nerves and margins paler coloured adaxially, and pale brown abaxially, with both surfaces sometimes blotched; lateral nerves in 1–4 (–6) pairs, oblique with the angle to midrib usually between 30°–45°, or subpatent, looping near the margins, prominent or obscure on adaxial surfaces, usually obscure or not apparent abaxially; reticulate venation distinct or obscure on adaxial surface; domatia 1–4 on each side of the midrib, usually present in the axils of the middle pairs of nerves, or absent. **Inflorescences** 1.2–6.0 cm long × 2–6 cm wide, (2–) 12–93-flowered; peduncles stout or slender, finely hairy or glabrous, the main one 3.0–30.0 mm long provided with minute bracts proximally or near the middle and terminated by 2(or 3)-branched cymes; axis branches 1.0–11.0 mm long, usually branched at apex with ultimate cymes to 35-flowered. **Flowers** 4- or 5-merous, sweetly perfumed; pedicels slender or stout, hairy or glabrous, those of solitary flowers 3.0–9.0 mm long, of others 0.5–4.0 mm long; calyx 1.0–2.0 mm long with tube cupular and limb 4- or 5-denticulate; lobes broad ovate, *c.*0.5 mm long and wide, glabrous; corolla 3.0–7.0 mm long, fleshy, white or cream; tube 0.5–2.0 mm long, usually sparsely deflexed hairy at throat; lobes lanceolate or ± oblanceolate, 2.0–5.0 mm long × 0.75–1.5 mm wide, obtuse, thick coriaceous, papillose at apex and along margins, erect or slightly recurved; disc glabrous or puberulous; stamens exserted; filaments 1.0–3.0 mm long; anthers 1.5–3.5 mm long, ± sagittate at base, erect, rarely recurved; style with stigma 4.0–10.0 mm long, exserted; stigma 1.5–2.0 mm long. **Fruits** subglobose, broad ellipsoid or obovoid, slightly compressed, 5.0–6.0 mm long × 3.0–8.0 mm wide, black and glossy when ripe; pyrenes ellipsoid, subovoid or hemispherical, usually slightly rugose.

Distribution and habitat: Pacific Islands, including Hawaii and Mariana Islands, Fiji, Vanuatu and New Caledonia, Papua New Guinea and Australia; in a wide variety of habitats including along beaches, along creeks, on hillsides, ridges and sandstone, mostly in dry rainforests.

Diagnostic attributes: *Psydrax odorata* is readily distinguishable by its usually exceedingly glossy, sometimes vernicose, usually thick leaf blades which are mostly provided with domatia, its usually ovate-cuspidate, prominently keeled and lobed stipules, its pedunculate, usually many-flowered inflorescences with 4- or 5-merous flowers, short and stout or long and slender pedicels and flowers of branches of the cymes secund and sometimes subsessile, and by its fleshy corollas.

Notes: *Psydrax odorata* was found to be one of the most variable and complex species of the genus *Psydrax* in Australia. Within the material broadly belonging to this species available for study, quite distinct taxa are distinguishable. One of these has keel-less, usually obtuse stipules, whereas the others have stipules with a distinct keel which is attenuated into a folded lobe at apex.

Some of the past confusion within this species started when Bentham (1867) combined *Canthium lamprophyllum* F.Muell. under *Canthium odoratum* (for which he used the illegitimate name *Canthium lucidum*) and cited many collections including syntypes of *C. lamprophyllum* F.Muell. (see under *C. lamprophyllum* below).

Although Bentham considered all the Australian specimens he called *Canthium lucidum* to be ‘precisely’ those of the Pacific Islands now know as *Psydrax odorata*, Merrill & Perry (1945) and Bridson (1985) considered the Australian specimens to be specifically distinct from the Pacific species and referrable to *Psydrax lamprophylla*. However, as indicated previously, we agree these species are distinct but consider that both occur in Australia.

The name *Plectronia hookeriana* was provided in 1929 by Domin for the Australian plants previously known as *Canthium lucidum* Hook. & Arn. (of which *C. lamprophyllum* F.Muell. was then considered to be a synonym). This was because when *Canthium* Lam. was transferred to the genus *Plectronia* L., the combinations *Plectronia lucida* K.Schum. & Krause (= *Psydrax horizontalis* (K.Schum. & Thonn.) Bridson) and *Plectronia lamprophylla* K.Schum. (= *Psydrax micans* (Bullock) Bridson) already existed for taxonomically different species from Africa thus inhibiting transfer of Hooker and Arnott’s, and Mueller’s epithets. The taxon Domin called *Plectronia hookeriana* var. *dietrichiae* Domin, however, belongs to *Tarenna* Gaertn. *sensu lato*, not *Psydrax*.

Variability: *Psydrax odorata* varies greatly, both in Australia and in the Pacific Islands, in the shape, size, glossiness and texture of its leaf blades, the hairiness of branchlets and inflorescences, the size of its flowers, and in its habitat of occurrence. Specimens from Fiji and that from New Guinea examined for this study resemble the type specimen from Vanuatu and others from the latter country in their thin coriaceous, shiny, elliptic leaf blades, their regularly parallel lateral nerves, fine reticulate venation, very open fragile inflorescences with slender peduncles and pedicels, and their small, 4-merous flowers. Most of the collections of this taxon from other Pacific Islands and some from Vanuatu, particularly *Flower* s.n.(BM, BRI, K, PVNH), are usually provided with thick glossy leaf blades with either loose-flowered slender inflorescences or dense-flowered compacted inflorescences. Some of these approach the Australian collections either in attributes of their leaf blades or inflorescences, whereas some, especially collections from Hawaii, appear to be quite different from the Australian ones and the type. However, the variation observed in specimens from both Australia and the Pacific region suggests we are dealing with only local variants of one very variable species. However, till now, with the exception of *C. odoratum* var. *tiniantense* (Kanehira) Fosberg from Micronesia, none of this infraspecific variation has been formally recognised.

Since none of the Australian collections of this taxon match exactly the type of *Psydrax odorata*, they are treated here as belonging to segregate subspecies of this species. Within the Australian material, three such subspecies are distinguishable. They are the newly recognised *P. odorata* subsp. *arnhemica*, a taxon from northern Australia which is most like the specimens from the Pacific regions in its leaf blades, loose inflorescences and slender pedicels, and *P. odorata* subsp. *australiana*, a taxon from eastern Australia which differs from the above by its compact glabrous inflorescences, short thick pedicels and small or medium-sized very glossy leaf blades, as well as *P. odorata* subsp. *buxifolia*, based on *Canthium buxifolium* Benth. These three subspecies may be distinguished from the typical subspecies as follows.

Key to Australian subspecies of *Psydrax odorata* and the extra-Australian *P. odorata* subsp. *odorata*

1. Leaf blades 1.5–4.2 cm long × 0.6–2.0 cm wide; inflorescences 2–22 (–49)-flowered 2
   Leaf blades usually more than 4 cm long × 2 cm wide; inflorescences 12–93-flowered 3

2. Young branchlets and inflorescence axes glabrous or subglabrous; domatia present on the leaves; leaf blades thick coriaceous. . . . **6c. P. odorata** subsp. **australiana**
   Young branchlets and inflorescence axes hairy; domatia usually absent on the leaves; leaf blades thick or thin coriaceous . . . . **6d. P. odorata** subsp. **buxifolia**

3. Young branchlets and inflorescence axes usually glabrous; inflorescences usually compact, much-branched and densely flowered; flowers on branches of the cyme subsessile or on short stout pedicels; stems usually swollen (myrmecophilous) . . . . **6c. P. odorata** subsp. **australiana**
   Young branchlets and inflorescence axes usually hairy; inflorescences usually open, laxly branched and flowered; flowers on branches of the cyme on slender pedicels; stems not myrmecophilous 4

4. Inflorescences (28–) 40–70-flowered, compact, much branched with flowers densely arranged on branches; flowers mostly 4-merous; corolla 3.0–5.0 mm long; disc glabrous; leaf blades thin or thick coriaceous; petioles 0.5–0.8 cm long . . . . **6a. P. odorata** subsp. **odorata**
   Inflorescences 12–48-flowered, loose-branched and loose-flowered; flowers mostly 5-merous; corolla 5.0–7.0 mm long; disc hairy; leaf blades usually thick coriaceous; petioles 0.6–1.1 cm long. . . . . **6b. P. odorata** subsp. **arnhemica**

6a. P. odorata subsp. odorata

Branchlets finely hairy or glabrous. Leaf blades 4.5–8.3 cm long × 2.5–4.0 cm wide, with lateral nerves usually regularly parallel, subpatent or oblique, and looping at margins; domatia present or absent. Flowers 4.0–6.0 mm long, usually chartaceous, 4-merous; pedicel of solitary flower 2.5–10.0 mm long.

Representative specimens (typical form only): **New Guinea**. Western Division: Mabaduan, Apr 1936, *Brass* 6539 (BRI). **Vanuatu**. Erromanga: Dillons Bay, Feb 1982, *Cabalin* 1455 (PVNH); ditto, Dec 1984, *Sam* 298 (PVNH). Éfaté: Ouen Tora Park, near the PVNH herbarium, Sep–Oct 1995, *Flower* s.n. (BRI). **New Caledonia**. Dothio River valley near Thio, Mar 1983, *McPherson* 5577 (BRI). **Fiji**. Macuata Coast, Jan 1924, *Greenwood* 555 (BRI).

***Distribution and habitat*:** Papua New Guinea, Vanuatu, New Caledonia and Fiji; chiefly coastal, on beaches, ridges and flats, in vine thickets.

***Diagnostic attributes*:** *Psydrax odorata* subsp. *odorata* is characterised by its finely hairy branchlets and inflorescence axes, usually thin coriaceous leaf blades, fragile inflorescences with usually very slender peduncles and

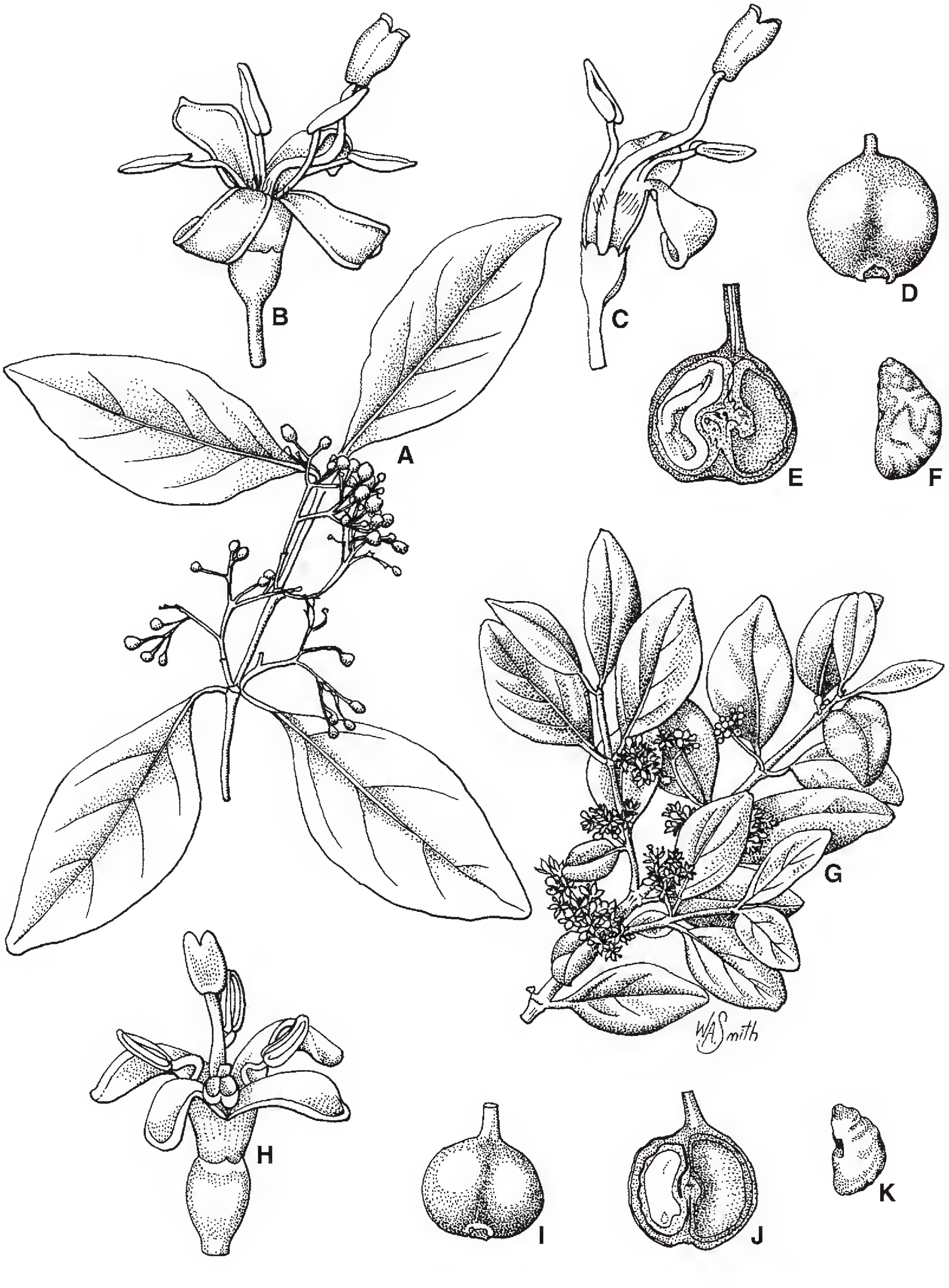

Fig. 3. ***Psydrax odorata*** subsp. ***arnhemica***. A. fruiting habit × 0.8. B. flower × 6. C. LS of flower × 6. D. fruit × 3. E. LS of fruit showing embryo × 3. F. pyrene × 3. A, *Dunlop* 7629 (CANB); B&C, *Byrnes* 2830 (DNA); D–F, *Dunlop* 3258 (BRI). ***Psydrax odorata*** subsp. ***buxifolia***. G. flowering branch × 0.8. H. flower × 6. I. fruit × 3. J. LS of fruit showing embryo × 3. K. pyrene × 3. G from Lebler 1978, p.530; H. *McDonald* 4131 & *Williams* (BRI); I–K, *Forster* PIF2492 *et al*. (BRI).

pedicels, and its comparatively small, 4-merous flowers.

Notes**:** The *Flower* s.n. specimen cited above has slightly thicker leaf blades and peduncles and also more flowers in each inflorescence than do the other collections cited above.

6b. P. odorata subsp. **arnhemica** S.T.Reynolds & R.J.F.Hend., **subsp. nov.** a *P. odorata* subsp. *australiana* inflorescentiis laxis, paucifloris, ramis puberulentis, petiolis pedicellisque longioribus et floribus plerumque 5-meris differt. **Typus:** Northern Territory. Gunn Point, 12°10’S, 131°05’E, 20 December 1989, *J. Russell-Smith* 8171 & *Lucas* (holo: BRI; iso: DNA).

Young branchlets, stipules, petioles, young leaf blades and inflorescence axes finely hairy or sometimes glabrous. Petioles 0.6–1.1 cm long; leaf blades (4.5–) 6.3–8.7 (–9.0) cm long × (2.1–) 3.0–4.4 (–5.6) cm wide, with apex subacute or shortly acuminate and base subacute or abruptly obtuse and shortly attenuate and decurrent into the petiole, drying dark brown or red brown adaxially; lateral nerves in 4–6 pairs, exceedingly slender, at an angle of more than 45° to the midrib; domatia small, usually present along the midrib Inflorescences loosely branched, 12–48-flowered; main peduncle (0.8–) 2.0–3.0 cm long, the ultimate cymules 2–5-flowered. Flowers usually 5-merous; pedicel of solitary flowers 4.0–9.0 (–12.0) mm long, of the others (1.0–) 2.5–4.5 mm long; corolla lobes elliptic or lanceolate, 3.5–5.0 mm long, papillose at apex and margins, finely reticulate veined. Pyrenes depressed ovoid, usually rugose; fruiting pedicels to 15.0 mm long. **(Fig. 3A–3F)**

Representative specimens**: Western Australia.** 4.5 km NW of Cliffy Point on Middle Island, Bonaparte Archipelago (14°19’S, 126°00’E), Jun 1987, *Kenneally* 10233 & *Hyland* (PERTH); 6.7 km SSE of Walsh Point (14°37’S, 125°51’E), Jun 1987, *Kenneally* 10340 & *Hyland* (PERTH); 9 km NNE of Meeloyoo Hill (14°46’S, 126°27’E), Jun 1987, *Kenneally* 10380 & *Hyland* (PERTH). **Northern Territory**. between Groote Eylandt & mainland, Jan 1803, *Brown* s.n. (CANB); Cannon Hill (11°58’S, 132°56’E), Dec 1972, *Byrnes* 2830 (DNA, K); ditto, Nov 1976, *Dunlop* 4300 (BRI, K); NE coast of Cape Van Diemen, Melville Island, 11°10’S, 130°15’E, May 1978, *Webb & Tracey* 12281 (BRI); 2 km N of Nabarlek airstrip, Apr 1979, *Rankin* 2106 (BRI, DNA, K); Waterfall Creek, 13°28’S, 132°26’E, Nov 1980, *Dunlop* 5605 (BRI, DNA); Nourlangie Rock, 12°52’S. 132°49’E, Dec 1983, *Russell-Smith* 920 (BRI, DNA); Yirrkala, Shady Beach (12°08’S, 136°55’E), Sep 1985, *Wightman* 2251 (DNA); Groote Eylandt, Angyowmanja Creek (13°59’S, 136°41’E), Jul 1987, *Russell-Smith* 2820 & *Lucas* (DNA); East Alligator River (12°50’S, 133°22’E), Dec 1987, *Dunlop* 7629 (CANB); Gunn Point (12°10’S, 131°05’E), Dec 1989, *Russell-Smith* 8171 & *Lucas* (DNA); ditto, Feb 1990, *Leach* 2697 & *Dunlop* (CANB, DNA); Wigram Island, English Company Islands (11°45’S, 136°37’E), Jul 1992, *Leach* 3065 (DNA); Craw Claw Island (12°42’S, 130°38’E), Dec 1993, *Egan* 2879 (DNA).

Distribution and habitat**:** Northern Australia, including offshore islands, common in Arnhem Land; usually on sandstone, sandstone outcrops, lateritic cliff faces and gorges, in coastal vine thickets, on sandy soil. **(Map 4)**

Diagnostic attributes**:** *Psydrax odorata* subsp. *arnhemica* is characterised by laxly branched, few-flowered inflorescences with long slender peduncles and pedicels, and by its usually finely hairy young branchlets, young leaves and inflorescence axes. It may be distinguished from *P. odorata* subsp. *australiana*, which has more or less similar leaves, by its open inflorescences, larger flowers and comparatively long slender pedicels.

Note**:** The inclusion of the collections from Western Australia above is tentative because the specimens concerned are incomplete.

Etymology**:** The subspecific epithet *arnhemica*, Latin for ‘from Arnhem Land’ (in the Northern Territory), refers to where this taxon is common.

6c. P. odorata subsp. **australiana** S.T.Reynolds & R.J.F.Hend., **subsp. nov.** a *P. odorata* subsp. *odorata* inflorescentiis plerumque glabris, pedunculis pedicellisque brevioribus crassioribus, foliis lamina crassiore adaxialiter pernitenti et floribus corollis carnosis non plerumque chartaceis differt. **Typus:** Queensland. Wide Bay District: Stony Creek, 4 km E of Didcot, 25°28’S, 151°51’E, 25 October 1993, *P.I. Forster* PIF14127 (holo: BRI; iso: A, CANB, DNA, K, L, MEL, NSW, QRS).

Canthium odoratum subsp. (Didcot P.I.Forster PIF14127), P.I. Forster & D.A. Halford (2002, p.174).

Young branchlets, peduncles and pedicels glabrous, rarely subglabrous. Petioles 0.25 – 0.6 cm long; leaf blades 3.5–8.3 (–9.3) cm long ×

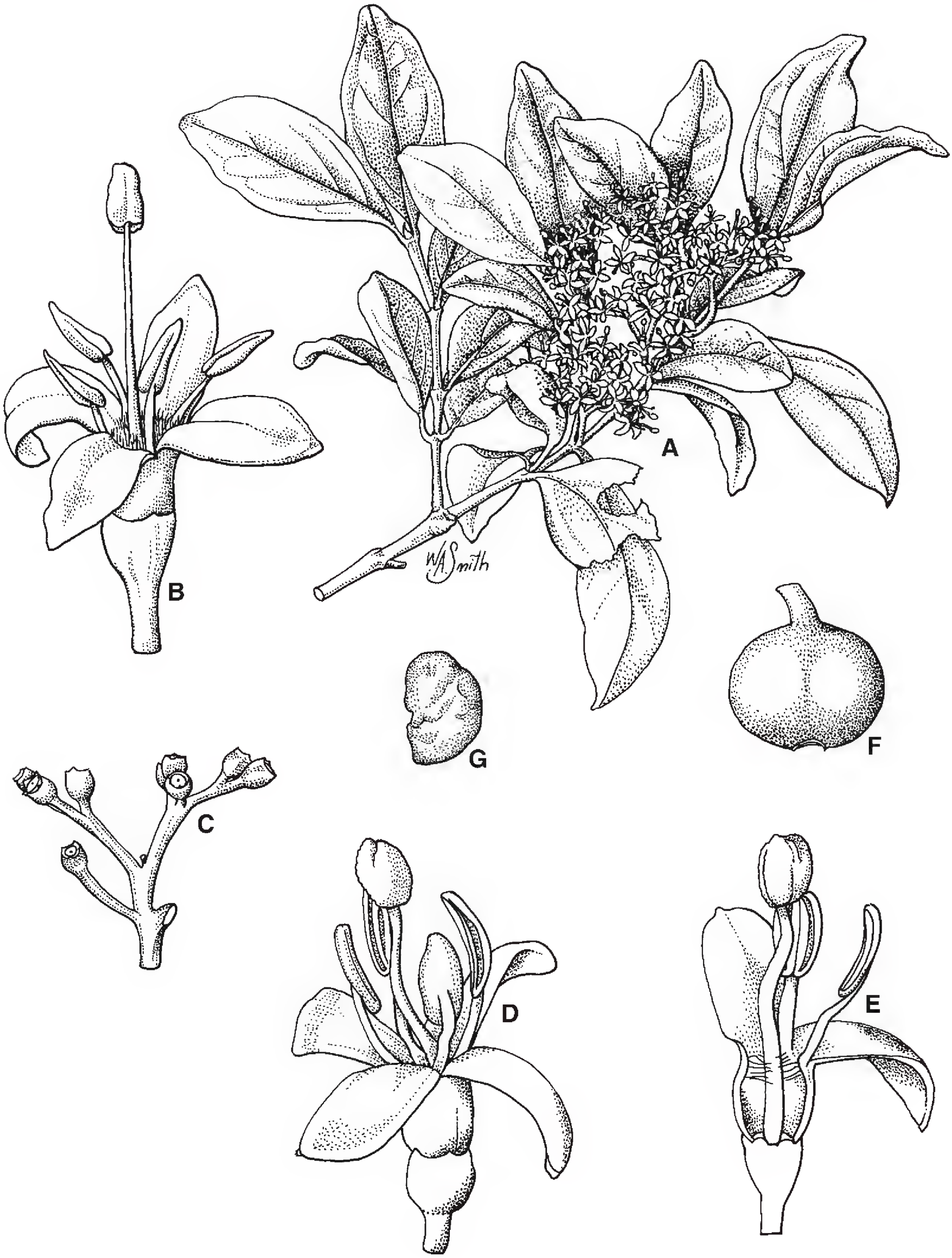

Fig. 4. ***Psydrax odorata*** forma ***australiana***. A. flowering habit × 0.6. B. flower × 6. A&B from Lebler 1978, p.527. ***Psydrax odorata*** forma ***subnitida***. C. part of inflorescence showing calyx and pedicel × 2. D. flower × 6. E. LS of flower × 6. F. fruit × 3. G. pyrene × 3. C–E, *Forster* 14257 (BRI); F&G, *Batianoff* 900127 (BRI).

1.4–4.4 (–5.2) cm wide, with apex obtuse, acute, subacute or shortly acuminate and base subacute and attenuate into petiole, usually glossy on adaxial surface, dull and opaque below; lateral nerves in (1–) 2–4 pairs, slender, suboblique or oblique; domatia 1–3 on each side of midrib. Inflorescences with densely flowered branches, (15–) 53–93-flowered; main peduncle 0.5–2.5 cm long. Flowers 4(or rarely 5)-merous; pedicel of solitary flowers 3.0–7.0 mm long, of the others 0.5–3.5 mm long; corolla lobes sublanceolate, 3.5–5.0 mm long. Pyrenes broad depressed ovoid, slightly rugose.

***Diagnostic attributes*:** *Psydrax odorata* subsp. *australiana* is readily recognisable by its usually exceedingly adaxially glossy thick leaf blades, glabrous branchlets, glabrous many-flowered usually compact inflorescences, short thick pedicels with flowers on the lateral branches of the cyme often subsessile, and usually 4-merous flowers with fleshy corollas. It differs from the typical subspecies by its thicker leaves, compact, many-flowered inflorescences, subsessile flowers with short stout pedicels, and by its distended myrmecophilous stems and branches. The plants in Vanuatu belonging to the typical subspecies are reported to have a different growth form from the Australian ones and are without insect galls (P. Flower, pers. comm. to STR).

***Etymology*:** The subspecific epithet *australiana*, Latin for ‘pertaining to Australia’, refers to the distribution of this subspecies.

Variability: *Psydrax odorata* subsp. *australiana* varies considerably in attributes of its leaves. On this basis, several forms or subforms were distinguishable in the specimens of it available for study. Though only three forms are formally recognised here, they are sometimes connected by intergrading specimens.

Key to forms of *Psydrax odorata* subsp. *australiana*

1. Leaves with very conspicuous domatia; leaf blades broad elliptic-ovate, usually between 4.0–5.2 cm wide .... **6c(ii). P. odorata** forma **foveolata**
   Leaves with usually small, inconspicuous domatia; leaf blades elliptic, elliptic-obovate, elliptic-ovate or subrhombic, 1.4–4.4 cm wide 2

2. Leaf blades pale or dark green, glossy on the adaxial surface; reticulate veins usually distinct on adaxial surface; domatia 1–3 on each side of the midrib, prominent or obscure .... **6c(i). P. odorata** forma **australiana**
   Leaf blades pale or yellowish green, slightly shiny or dull on the adaxial surface; reticulate veins usually not apparent on the adaxial surface; domatia 1 or 2 on each side of the midrib, usually small .... **6c(iii). P. odorata** forma **subnitida**

6c(i). P. odorata forma **australiana** S.T.Reynolds & R.J.F.Hend., **forma nov.** ab formis aliis *P. odoratae* subsp. *australianae* foliis adaxialiter nitidis et domatiis inconspicuis differt **Type:** As for **P. odorata** subsp. **australiana**.

Young branchets and inflorescences glabrous, rarely subglabrous; leaf blades elliptic, narrow elliptic, elliptic-ovate, elliptic-oblong or slightly rhombic; lateral nerves oblique or suboblique, in (1–) 2–4 (–6) pairs with usually 2 or 3 pairs more obvious than others and looping at margins. Inflorescences (15–) 53–92-flowered; main peduncles (5–) 15–25 mm long. **(Fig. 4A, 4B)**

***Additional representative specimens*:** **Queensland.** Cook District: Timber Reserve 14, Massey, 13°52’S, 143°23’E, Nov 1980, *Hyland* 10874 (BRI); Bakers Blue Mountain, Font Hills Station, 19 km S of Mt Carbine, 16°43’S, 143°10’E, Jan 1989, *Fell* 1591 (BRI); West Claudie River, 10.3 km WNW of Lockhart River, 12°44’S, 143°15’E, Mar 1994, *Fell* 4145 (BRI). North Kennedy District: Barrabas Scrub (20°10’S, 146°45’E), May 1972, *Hyland* 6076 (QRS)*^{2}; Townsville Road, 14 km N of Bowen, 19°30’S, 147°57’E, Nov 1976, *Sharpe* 68 (BRI)*^{2}; Bucks Gully Scrub (18°37’S, 142°08’E), May 1979, *Hyland* 9841 (QRS)*^{2}; Jervoise Holding (18°34’S, 144°43’E), May 1979, *Hyland* 9937 (QRS)*^{2}; 40 Mile Scrub National Park, 1.6 km north of Mt Surprise road junction on Kennedy Highway, 18°07’S, 144°49’E, Nov 1983, *Stocker* 1806 (BRI); ditto, Mar 1987, *Clarkson* 6886 & *McDonald* (BRI)*^{2}; ditto, Feb 1990, *Hyland* 13989 (BRI); Whitsunday Island, 20°16’S, 148°56’E, Nov 1985, *Batianoff* 3020 & *Dalliston* (BRI);

Mt Stuart, 9 km S of Townsville, 19°21'S, 146°47'E, Dec 1991, *Bean* 3866 (BRI); Port Denison, date unknown, *Fitzalan* s.n. [MEL1538534 & MEL1538536](MEL). South Kennedy District: southern end of Lake Elphinstone, 21°33'S, 148°13'E, Nov 1987, *Champion* 322 (BRI); Hazelwood Gorge, 21°15'S, 148°27'E, 13 km SSW of Eungella, Dec 1992, *Bean* 5269 (BRI). Leichhardt District: Carnarvon Development Road, 80 km N of Injune, 25°05'S, 148°15'E, Nov 1988, *Schefe* CMW1147 (BRI); near Theodore, 24°55'S, 150°05'E, Dec 1989, *Phillips* s.n. (BRI). Port Curtis District: Mt Etna, 23°10'S, 150°25'E, Oct 1976, *Hyland* 9104 (BRI); ditto, Nov 1987, *Vavryn* 26 (BRI). Burnett District: about 20 miles (32 km) NNW of Monto, in 1983, *Barlett* s.n. (BRI); 1.5 km along Archookoora Road from Kingaroy–Cooyar road, about 18 km SSE of Kingaroy, Dec 1986, *Beesley* 975 & *Ollerenshaw* (CANB); Coominglah State Forest 28, 24°53'S, 151°00'E, Apr 1990, *Forster* PIF6702 (BRI). Wide Bay District: Coongara Rock, 18 km S of Biggenden, 25°35'S, 152°05'E, Dec 1977, *Young* 8 (BRI); Coast Range, 9 km E of N of Goomeri, 26°07'S, 152°06'E, Oct 1990, *Pedley* 5579 (BRI, NSW). Moreton District: Samford Range, Jan 1930, *Meebold & White* s.n. (BRI); Whiteside, North Pine River near Brisbane, 27°13'S, 152°57'E, Jan 1932, *Blake* 3196 (BRI, K); Bangaree Enviromental Park, 2 km ENE of Crows Nest, 27°16'S, 152°04'E, Apr 1993, *Halford* 1664, *Thomas & Thompson* (BRI); 10.5 km NW of Ballandean, 28°45'S, 151°45'E, Dec 1994, *Halford* 2361 (BRI); 10 km SE of Pittsworth, 27°46'S, 151°42 'E, Feb 1995, *Halford* 2394a (BRI), 2394b (BRI). **New South Wales.** Richmond River, in 1876, *Fawcett* [NSW193681](NSW); Lismore, Nov 1894, *Bauerlen* s.n. (NSW); Kerrabia via Rylstone, Nov 1895, *Dawson* s.n. (NSW); 9 miles (*c.*14.4 km) E of Aberdeen, Hunter Valley (32°09'S, 151°03'E), Aug 1959, *Storey* 6605 (CANB). (For specimens above marked *^{2}, see **40-Mile Scrub form** below.)

***Distribution and habitat*:** Eastern Australia, from Cape York Peninsula, Queensland, to Hunter River, New South Wales; along creeks and rivers, steep hillsides, stony ridges, rocky outcrops, rocky water courses, usually in dry rainforests, also on beach dunes, on sandy loamy, clay or stony soils. (**Map 4**)

***Note*:** The use of the epithet '*australiana*' in the name of this form follows Recommendation 26A.3. in the current International Code of Botanical Nomenclature (Greuter *et al.*, 2000).

***Variability*:** The leaf blades of *Psydrax odorata* forma *australiana* are variable and several ill-defined subforms exist. Specimens from along creek and river banks and usually from dry rainforests are typical of this form. They have very shiny, mostly medium-sized, elliptic, ovate-elliptic, subrhombic to subobovate leaf blades with prominent oblique nerves and reticulate venation, and large many-flowered inflorescences. Specimens from coastal areas, especially those from off-shore islands, usually have smaller or thicker leaves which are usually only slightly shiny on the adaxial surface. These are not unlike those of *P. odorata* forma *subnitida* except that they are larger and broader (broad elliptic or obovate) than what is allowed for in that form. Specimens from steep ridges and hillsides tend to have narrower, thicker and often more shiny leaf blades than those on other specimens. Moreover, some of the collections from north Queensland approach *P. odorata* subsp. *arnhemica* in their leaves, subglabrous or sparsely hairy branchlets and inflorescence axes, slender peduncles and pedicels but differ from that in their general aspect, compact inflorescences with greater numbers of flowers, shorter pedicels and smaller flowers. On the other hand, collections from south-eastern Queensland, which possess small, elliptic or narrow elliptic, thick coriaceous leaf blades and small inflorescences resemble some of the collections filed under *P. odorata* subsp. *buxifolia*, but that taxon differs from them by its pubescent branchlets and peduncles, and usually efoveolate leaf blades. However, these subspecies (*P. odorata* subsp. *australiana* and *P. odorata* subsp. *buxifolia*) are sometimes connected by specimens with hairy branchlets and inflorescences, and foveolate leaf blades.

40-Mile Scrub form: Collections from deciduous vine thickets in the 40 Mile Scrub (as indicated by *^{2} in the list above) probably represent a distinct form or subform but they contain only fruiting material. Flowering material is necessary to be certain of this. However, these specimens differ from the other collections in their narrow infructescences and narrow, thick shiny leaves. These leaves usually have narrow elliptic blades with a subacute apex and base (or an acute base which is decurrent into the short petiole), which are dark green on the adaxial surface and pale green below. The lateral nerves are slender and obliqueand in 2 or 3 pairs. The reticulate veins are not apparent. One or two small domatia occur on each side of the midrib, or sometimes domatia are absent. The infructescences are 2.5–6.5 cm × *c.*3.0 cm, branched only towards the apex with the main peduncles usually to 4.5 cm long. Fruits are black when ripe. (**Map 1**)

6c(ii). P. odorata forma **foveolata** S.T.Reynolds & R.J.F.Hend., **forma nov.** *P. odoratae* formae *australianae* primo adspectu maxime similis, sed foliis latioribus et domatiis valde conspicuis differt. **Typus:** Queensland. Cook District: Aeroglen, 16°55'S, 145°45'E, November 1978, *B. Jago* 221 (holo: QRS).

Leaf blades broad elliptic-ovate or elliptic, thick coriaceous, drying dark brown and glossy adaxially, pale brown abaxially; lateral nerves in 4 or 5 pairs, obliquely arched and looping at margins of blade; domatia usually conspicuous, few on each side of the midrib. Peduncles and pedicels glabrous or subglabrous. Flowers mostly 5-merous; pedicels slender; corolla lobes slender.

***Additional representative specimens*: Queensland.** Cook District: Endeavour River, in 1882, *Persieh* [MEL 1533874](MEL); Hartleys Creek (16°39'S, 145°34'E), Apr 1946, *Flecker* s.n. (QRS); ditto, Dec 1987, *Sankowsky* 791 & *Sankowsky* (BRI); 2 km from Cooktown along McIvor River Road (15°29'S, 145°14'E), Feb 1983, *Telford* 9398 & *Butler* (CANB); State Forest Reserve 607, Parish of Cairns, Shoteel Logging Area, 16°55'S, 145°36'E, Feb 1985, *Gray* 3909 (BRI); Lizard Island, Cook's Lookout, 14°47'S, 145°28'E, Oct 1988, *Batianoff* 10274 (BRI); Round Mountain, Embly Range, 13°33'S, 143°30'E, Jun 1992, *Forster* PIF10495 & *Tucker* (BRI); Jane Table Hill, Lakefield National Park, 46.6 km N of Lakefield homestead, 14°30'S, 144°07'E, Mar 1993, *Fell* 2925 & *Stanton* (BRI). North Kennedy District: Round Mountain, SSW of Townsville, 19°27'S, 146°42'E, Jan 1996, *Cumming* 14040 (BRI).

***Distribution and habitat*:** North Queensland, common around Cooktown; on open slopes, rocky creek banks and frontal dunes, in semi-deciduous vine thickets, woodlands and grasslands on sandy loamy soil. (**Map 3**)

***Diagnostic attributes*:** This form resembles *P. odotata* forma *australiana* in its leaves and inflorescences, but differs by its very prominent domatia and usually broader leaves.

***Etymology*:** The forma epithet *foveolata*, Latin for 'minutely pitted', alludes to the very conspicuous domatia on the leaves of this form.

6c(iii). P. odorata forma **subnitida** S.T.Reynolds & R.J.F.Hend., **forma nov.** a *P. odorata* forma *australiana* foliis brevioribus crassioribusque, folii laminae paginis leviter nitentibus, nervis lateralibus indistinctis venatione reticulata obscura praeditis differt. **Typus:** Queensland. Darling Downs District: near Texas on the road to Stanthorpe, 28°51'S, 151°14'E, 7 November 1993, *P.I. Forster* PIF14257 (holo: BRI).

Canthium oleifolium var. *pedunculatum* Maiden & Baker, *Proc. Linn. Soc. N.S.W.* 9: 460 (1894). **Type**: New South Wales. Palistan, 30 miles (*c*.48 km) NW of Condobolin, Feb. 1892, *Clements* s.n. (syn: NSW [NSW155950]); ditto, Dec 1893, *Clements* s.n. (syn: NSW [NSW155949]).

Canthium odoratum forma (Texas P.I.Forster PIF14257), S.T. Reynolds (1997, p.180), P.I. Forster & D.A. Halford (2002, p.174).

Leaves with petioles 0.2–0.5 cm long; blades elliptic or subobovate, 3.5–6.5 cm long × 1.4–2.6 cm wide, with apex obtuse and base narrowed and attenuate into the petiole, matt green or pale green or slightly yellowish-green, thick and stiff especially when dry; lateral nerves in 1 or 2(or 3) pairs; domatia small, 1 or 2 on each side of midrib. Inflorescences 20–36-flowered; main peduncles 0.4–1.2 cm long. **(Fig. 4C–4G)**

***Additional representative specimens*: Queensland.** Leichhardt District: 24 miles (*c*.38.4 km) E of Taroom, Jul 1963, *Lazarides* 6943 (BRI, K, NSW); Mt Britton Mine, Homevale Station, Nebo, Dec 1973, *Webb & Tracey* 13725 (CANB); Bull Creek Gorge, Castlevale Station, about 13 km SW of homestead, 24°33'S, 146°45'E, Sep 1990, *McDonald* 4664 & *Bean* (BRI); 7 km NE of Taroom, 25°33'S, 149°55'E, Nov 1996, *Halford* Q3008 & *Dowling* (BRI). Warrego District: W boundary of Chesterton Range National Park, N of Morven, 26°10'S, 147°16'E, Sep 1995, *Bean* 8987 & *Grimshaw* (BRI). Maranoa District: 4 km W of Euloral, 27°08'S, 148°44'E, May 1982, *Neldner & Thomas* 783 (BRI). Darling Downs District: Kindon Station, 54 miles (*c*.86 km) NNE of Goodiwindi, 28°05'S, 150°45'E, Dec 1938, *Smith* 593 (BRI); 'The Ranch', 7 miles (*c*.11.2 km) N of Tara, Aug 1946, *Everist* 2671 (BRI). **New South Wales.** Gunnedah, Oct 1886, *Betche* [NSW193693] (NSW); Lachlan River near Lake Cudgellico, Jun 1891, *Maiden* s.n. (NSW); Murrumbo Creek, Goulburn River, Sep 1895, *Baker* [NSW193707] (NSW); Condobolin, Euabolong Road, Aug 1897, *Maiden* [NSW 193705] (NSW)*[3]; Gunnedah, Oct 1899, *Forsyth* [NSW193691] (NSW); Terry Hie Hie District, May 1914, *Julius* s.n. (NSW); Gungal, Nov 1914, *Boorman* s.n. (K, NSW [NSW 193700]; Ticketty Wells, W of Wallangara, Jul 1917, *Julius* s.n. (NSW); Warialda, May 1932, *Vickery* s.n. (NSW); about 2 km S of Warialda, Dec 1963, *Williams* 28 (NSW); Waa Gorge, Mt Kaputar National Park, 68 km NE of Narrabri, Nov 1976, *Coveny* 8989 & *Roy* (BRI, K); 14 km from Narrabri on road to Mt Kaputar, 30°19'S, 149°54'E, Dec 1994, *Forster* PIF15934 (BRI).

***Distribution and habitat*:** Central and south western Queensland and western New South Wales; usually in dry scrubs, on sandy soil amongst rocks, on slopes, ridges and hill sides. (**Map 5**)

***Diagnostic attributes*:** This form is characterised by its thick, pale green or yellowish green, subobovate or elliptic usually small leaf blades which are slightly shiny on the adaxial surface and dull and opaque on the abaxial surface, which have 1 or 2 pairs of obscure lateral nerves and 1 or 2 domatia on each side of the midrib. This form can be confused with *P. oleifolia* which also has dull leaf blades with indistinct nerves and short small inflorescences, and the plants also often grow in the same general area. However, *P. oleifolia* differs from this by its much duller, concolorous, usually efoveolate leaf blades, usually smaller flowers and fruits and has very slender pedicels.

***Notes*:** *Canthium oleifolium* var. *pedunculatum* Maiden & Baker is included as a synonym here because its type, collected from the Condobolin area of New South Wales, belong to the same taxon as that of *P. odorata* forma *subnitida*. Maiden also collected specimens of this taxon from the Condobolin area (see specimen marked *^{3} in the above list).

***Etymology*:** The forma epithet *subnitida*, from Latin *sub-*, 'somewhat', and *nitidus*, 'shiny', refers to the slightly shiny adaxial surface of the leaf blades of this form.

6d. P. odorata subsp. **buxifolia** (Benth.) S.T.Reynolds, **comb. & stat. nov.**; *Canthium buxifolium* Benth., *Fl. Austral.* 3: 422 (1867). **Type:** Queensland. Ad fluvium Burnett [et] Dawson, *Mueller* [MEL153843] (syn: MEL); Burnett River, *Mueller* s.n. (syn: K). ? New South Wales. exact locality unknown, *Leichhardt* s.n. (syn: MEL [MEL1538144]; ? isosyn: NSW [NSW193767]).

Branchlets, young leaves, petioles, peduncles, pedicels and calyx lobes minutely hairy. Stipules usually very conspicuous with a long (to 9.0 mm long), broad, more or less foliaceous, folded lobe at apex. Petioles 0.1–0.3 cm long; leaf blades elliptic, ovate or suborbicular, 1.5–4.2 (–5.0) cm long × (0.6–) 1.4–2.0 (–2.5) cm wide, with apex and base obtuse or subacute or with apex slightly rounded and both adaxial and abaxial surfaces glabrous or finely hairy towards the base, thin or thick coriaceous, the adaxial surface dark or pale green, drying dark brown but usually paler brown at the margin; lateral nerves in 1–3 pairs, exceedingly slender, indistinct; reticulate veins not apparent; domatia very rarely present Inflorescences (2*^{4}–) 14–22 (–49)-flowered; peduncles pubescent, the main one (3–)8–20 mm long; branches 1.0–3.5 mm long; pedicels pubescent, slender in solitary flowers, 3.5–7.0 mm long, stout in others and nearly obsolete, 0.5–2.0 mm long; calyx lobes sparsely hairy distally; corolla 3.0–5.0 mm long; tube 0.5–1.25 mm long; lobes elliptic, 2.5–3.5 mm long × 0.75–1.0 mm wide; filaments of stamens 1.0–1.5 mm long; anthers erect, 1.5–2.0 mm long; style (with stigma) 4.0–5.2 mm long. Fruits broad ellipsoid or obovoid but retuse at apex, 5.0–7.0 mm long × 3.0–8.0 mm wide; pyrenes depressed ovoid, slightly rugose. (**Fig. 3G–3K**)

***Diagnostic attributes*:** *Psydrax odorata* subsp. *buxifolia* is readily recognisable by its comparatively small, very glossy leaves, hairy branchlets and small inflorescences. It resembles *P. odorata* subsp. *australiana*, especially the small-leaved form, in its leaves, inflorescences, 4-merous flowers on short stout pedicels and fleshy corollas. However, that subspecies differs from *P. odorata* subsp. *buxifolia* by its foveolate leaves, usually glabrous branchlets and inflorescences. Moreover, the leaves of that variety are usually borne at right angles to the main axis of the branchlet whereas in *P. odorata* subsp. *buxifolia* the leaves are borne in the same plane as the main axis of the branchlet. These subspecies, however, are connected by intergrading specimens, ones with thicker leaves with or without domatia and with hairy branchlets and inflorescences.

***Variability*:** The leaves and inflorescences are variable in this subspecies; based on these attributes, two forms are recognised here.

Key to forms of *P. odorata* subsp. *buxifolia*

1. Leaves and inflorescences comparatively small; blades narrow elliptic, 1.5–2.0 mm long × 0.6–0.9 cm wide, thick; inflorescences 2–5-flowered*[4]; main peduncles 0.3–0.5 cm long . . . **6d(ii). P. odorata** forma **parviflorifra**

 Leaves and inflorescence comparatively larger; blades narrow elliptic or suborbicular, 2.5–5.0 cm long × 0.7–2.5 cm wide, elliptic, thick or thin; inflorescences 14–22 (–49)-flowered; main peduncles 0.8–2.0 cm long . . . . **6d(i). P. odorata** forma **buxifolia**

***Note*:** The character marked *[4] in the description and key above is uncertain because only the type material has been seen and the specimens concerned have only very old inflorescences with fruit on them.

6d(i). P. odorata forma **buxifolia** (Benth.) S.T.Reynolds & R.J.F.Hend., **comb. & stat. nov.**; *Canthium buxifolium* Benth, *Fl. Austral.* 3: 422 (1867). **Type:** as for *P. odorata* subsp. *buxifolia* above.

Most of the description of *P. odorata* subsp. *buxifolia* provided above applies to this form. Its leaves are variable though its broad elliptic, broad ovate or suborbicular, usually thin, efoveolate leaf blades, which are usually borne in a one plane along the branchlets, are typical of this form. However, specimens of it with thicker, often broader or larger leaf blades approach those of *P. odorata* subsp. *australiana*, but differ from the latter by their usually efoveolate leaves, and hairy branchlets and inflorescences.

***Additional representative specimens*:** **Queensland.** Burnett District: Mt Wooroolin near Kingaroy, 26°35’S, 151°45’E, Apr 1947, *Michael* 3002 (BRI); Munro’s Camp, 26°—’S, 151°—’E, Dec 1954, *Smith* 6283 (BRI, K); Bunya Mountains State Forest (State Forest 151 Tureen), Maidenwell road, about 3.5 km NNE of Munro’s Camp, 26°52’S, 151°38’E, Dec 1987, *McDonald* 4131 & *Williams* (BRI); N side of Bunya Mountains, 26°55’S, 151°35’E, Mar 1988, *Sterling* 1 (BRI). Darling Downs District: 2.5 km SSW of Gladfield, 28°06’S, 152°10’E, Jun 1986, *Forster* PIF2492, *Bird & Grimshaw* (BRI); MacKinnerny’s Irvingdale–Moola road, 27°10’S, 151°31’E, Jan 1993, *Smith* 34 (BRI); 5.6 km along Linthorpe road, N of Pittsworth, 27°39’S, 151°39’E, Feb 1996, *Bean* 9947 (BRI). Moreton District: Rosewood, May 1913, *White* s.n. (BRI); Hoya, Dec 1935, *Michael* 2267 (BRI); ditto, Mar 1936, *Michael* 2268 (BRI); Mt French, Jan 1936, *Smith* s.n. (BRI); Brisbane, Upper Brookfield, 27°25’S, 152°55’E, Feb 1978, *Jessup* 57 (BRI)*[5]; N of Boonah, Dec 1981, *Bird* s.n. (BRI); Indooroopilly, 27°31’S, 153°00’E, Nov 1982, *Wood* [AQ339614] (BRI); on Boonah–Ipswich road, 7 km N of Boonah, 28°00’S, 152°41’E, Feb 1989, *Williams* s.n. (BRI). **New South Wales:** Acacia Creek via Killarney, Dec 1905, *Dunn* [NSW193789] (NSW)*[5]; River Tree area, *c.*39 miles (62.4 km) E of Liston, *c.*25 miles (40 km) NW of Tabulam, Jul 1949, *Clark, Pickard & Coveny* 1780 (NSW); Sandy Hollow, Aug 1963, *Burgess* s.n. (CANB).

***Distribution and habitat*:** South-eastern Queensland and northern New South Wales; usually in semi-evergreen vine thickets on ridges and river banks. (**Map 6**)

***Notes*:** The collections marked *[5] in the above list have thick foveolate leaf blades and hairy inflorescences, and appear to be intergrades between *P. odorata* subsp. *buxifolia* and *P. odorata* subsp. *australiana*.

The use of the epithet *buxifolia* in the name of this form follows Recommendation 26A.3. in the current International Code of Botanical Nomenclature (Greuter *et al.*, 2000).

6d(ii). P. odorata forma **parviflorifra*** S.T.Reynolds & R.J.F.Hend., **forma nov.** a *P. odorata* forma *buxifolia* foliorum laminis minoribus, inflorescentiis minoribus paucifloris differt. **Typus.** Queensland. Moreton District: 4.5 km WSW of Mt Alford, 28°05’S, 152°23’E, 27 April 1986, *L.H. Bird* [AQ408941] (holo: BRI; iso: BRI).

Canthium sp. (Mt Alford L.H.Bird AQ408941), S.T. Reynolds (1997, p.180).

Canthium buxifolium var. (Mt Alford L.H.Bird AQ408941), P.I. Forster & D.A. Halford (2002, p.174).

Stipules ovate; leaf blades elliptic or narrow elliptic, 1.5–2.0 cm long × 0.6–0.9 cm wide, with apex obtuse and base subacute and narrowed into petiole, glossy on the adaxial surface; lateral nerves slender, obscure; domatia absent. Inflorescences (remnant ones only seen)

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* should be '***parviflorifera***' (PDB 2005)

2–5-flowered; pedicels slender, those of solitary flowers *c.*3.5 mm long, of others *c.*2.0 mm long. Fruits obovoid, 5.0–5.5 mm long × 3.0–5.0 mm wide, 2-lobed, bluish black; pyrenes rugose.

***Distribution and habitat*:** Known only from the type collection; in Araucarian microphyll vine forest. (**Map 8**)

***Etymology*:** The forma epithet *parviflorifra*, from Latin *parvus*, 'small', and *florifer*, 'flowerbearing', refers to the small inflorescences in this form.

6d(iii). Mundubbera form *Canthium buxifolium* forma (Brigooda P.I.Forster PIF5657), P.I. Forster & D.A. Halford (2002, p.174).

The collections of *P. odorata* from around Mundubbera, southeastern Queensland, listed below probably represent a distinct form of *P. odorata* subsp. *buxifolia* but as the specimens are without well-developed flowers, it is not possible to be certain of this.

Queensland. BURNETT DISTRICT: Monogorilby, Mundubbera Shire, 26°01'S, 151°00'E, Dec 1981, *Forster* 213B (BRI); 2.5 km E of Brigooda, 26°15'S, 151°26'E, Aug 1989, *Forster* PIF5657 (BRI); Fontainea Scrub, State Forest 172, Gurgeena Plateau, 25°26'S, 151°23'E, Mar 1994, *Forster* PIF15068 (BRI).

The taxon represented by these specimens may be described as having: Branchlets greyish coloured mottled with white; young branchlets, petioles, peduncles and pedicels finely pubescent. Stipules comparatively small, keeled and attenuated into an acuminate lobe at apex; petioles 0.15–0.3 cm long; leaf blades narrow elliptic or subobovate elliptic, 2.5–4.5 (–5.0) cm long × 0.9–1.5 (–2.5) cm wide, with apex subacute or obtuse and base cuneate, exceedingly glossy on adaxial surface, drying dark brown with usually paler coloured margins adaxially, pale brown or pale olive-green abaxially, thick coriaceous; lateral nerves in 3 pairs, obliquely arching, looping at margins; reticulate veins not apparent; domatia (1–) 2–4 on each side of midrib, prominent. Inflorescences 1.3–1.8 cm long × 1.0–2.0 cm wide, 11–19-flowered; main peduncle 4.0–10.0 mm long; flowers 4-merous; pedicel of solitary flowers 2.0–2.5 mm long, of others 0.5–1.0 mm long; calyx 1.0–1.5 mm long; corolla 4.5–6.0 mm long, corolla tube 2.0–2.5 mm long, sparsely hairy at throat; corolla lobes subacute at apex, 2.5–3.5 mm long; filaments *c.*1.0 mm long; anthers *c.*2.5 mm long. Fruits broad ellipsoid, *c.*6.0 mm long × 4.0 mm wide, black when ripe; pyrenes rugose.

***Distribution and habitat*:** Occurring around Mundubbera, southeastern Queensland; in semi-evergreen vine thickets in hilly rocky country. (**Map 1**)

***Diagnostic attributes*:** The above specimens resemble *P. odorata* forma *buxifolia* in their small very shiny leaves, dark brown adaxial surface of dried leaves (with paler margins), and small inflorescences, but differ from that form as follows:

Domatia present on the leaves, usually 2–4 on each side of the midrib
. . . . **P. odorata 'Mundubbera form'**
Domatia rarely present on the leaves but when so, only one on each side of
the midrib . . . . **P. odorata** forma **buxifolia**

The above specimens also resemble the small-leaved form of *P. odorata* forma *australiana*, but that form differs from them by its glabrous branchlets and inflorescences, less shiny and pale brown adaxial surface of dried leaves, and fewer domatia (only 1 or 2 domatia on each side of the midrib).

7. Psydrax lamprophylla (F.Muell.) Bridson, *Kew Bull.* 40: 724 (1985); *Canthium lamprophyllum* F.Muell, *Fragm.* 2: 133 (1861). **Type:** Queensland. MORETON DISTRICT: near Brisbane River, in 1855, *F. Mueller* s.n. (lecto, here designated: MEL [MEL1538219]; isolecto: K, MEL [MEL1538225]).

Canthium sp. 1., Ross, E.M. in T.D. Stanley & E.M. Ross, *Fl. south-eastern Queensland* 2: 343 (1986).

[*Canthium lucidum* auct. non Hook. & Arn.: G. Bentham, *Fl. Austral.* 3: 421 (1867 '1866') quoad speciminibus Brisbane River, Moreton Bay, [leg.] *F. Mueller* et Tweed River, [leg.] *C. Moore*].

Trees 5–20 m high; trunk to *c.*30 cm dbh; bark dark brown, smooth or closely longitudinally fissured; young parts and inflorescence axes with short spreading hairs; branchlets quadrangular towards their apices, lenticellate, glabrous. **Leaves** opposite; stipules lacking a keel and an apical lobe, *c.*3.0 mm long × 2.0 mm wide, ± membranous, usually connate to above the middle, with broad ovate, obtuse lobes, or stipules slightly truncate and very rarely provided with a minute, obscurely keeled lobe, hairy outside, with colletors present at base adaxially; petioles (0.4–) 1.0–3.0 cm long, usually flexuose, deeply channelled above; blades elliptic, broad elliptic, elliptic-oblong, ovate-elliptic or ovate-oblong, (8.5–) 10.5–18.0 (–20.0) cm long × (3.1–) 4.0–8.7 (–9.7) cm wide, with apex and base acuminate or subacute, or apex abruptly shortly acuminate or obtuse and base obtuse, slightly rounded, subcordate or truncate and shortly decurrent into the petiole, coriaceous; both surfaces glabrous, the adaxial surface dark green, glossy, drying brown or with a yellowish tinge, sometimes dotted with insect galls, the abaxial surface pale or dull green; lateral nerves in 4–7 pairs, oblique or subpatent, the lower pairs ± acutely angled to the midrib and ascending distally; reticulate venation loosely arranged, fine, distinct or indistinct; midrib and nerves usually raised in dried specimens; domatia present or absent. **Inflorescences** robust, 2.5–8.0 cm long × 2.5–8.5 cm wide, 130–145-flowered; peduncles pubescent or puberulent, basal one 1.5–3.5 cm long, thickened towards the middle or base, provided with minute denticulate bracts usually about a third of its length from the base, usually terminated by 3 branches; branches usually thickened, bifurcate, 0.5–2.5 cm long, terminated by 23–45-flowered cymes. **Flowers** 4(or 5)-merous; pedicel of solitary flowers (1.5–) 4.0–6.0 (–9.0) mm long, of others 0.5–3.0 mm long; calyx *c.*1.0 mm long, minutely patent hairy, with tube cupular and limb 4(or 5)–denticulate; lobes ovate, minute; corolla 3.5–6.5 mm long with tube narrow or broad campanulate, 1.5–3.5 mm long × 1.5–3.0 mm wide, with sparse or dense reflexed hairs at the throat and puberulent abaxially; lobes elliptic or lanceolate, 2.0–3.5 mm long × *c.*1.0 mm wide, thick, papillose, obtuse and reflexed at apex, sparsely puberulous abaxially especially distally; disc usually sparsely minutely hairy; stamens included; filaments erect, about 1 mm long; anthers erect or ± recurved, 1.5–2.0 mm long, slightly papillose; style (with stigma) 5.0–10.0 mm long; stigmatic knob oblongoid, 2-lobed at apex. **Fruits** broad ellipsoid, divaricately 2-lobed, 0 5–1.0 cm long × 0.7–1.2 cm wide, usually with a red glandular layer under pericarp; pyrenes ellipsoid, usually exceedingly rugose.

***Diagnostic attributes*:** *Psydrax lamprophylla* is readily distinguishable from other species of *Psydrax* in Australia by its slightly membranous stipules which are neither keeled nor lobed at the apex. It resembles *Psydrax cymigera* (Valeton) S.T.Reynolds & R.J.F.Hend. from New Guinea in its large leaves and inflorescences, but the stipules in that species are keeled and attenuated into a folded lobe at the apex.

***Notes*:** The taxonomy and nomenclature of *Psydrax lamprophylla* and *P. odorata* have been confused since Bentham (1867) treated the species concerned as conspecific and used the name *Canthium lucidum* Hook. & Arn. for his taxon. He did not appreciate that that name is illegitimate, being a later homonym of *Canthium lucidum* R.Br., and was possibly unaware that *Canthium odoratum* (Forst.f.) Seem. should have been used for his species when treating it as belonging to *Canthium.*

Mueller cited several syntypes in his protologue for *Canthium lamprophyllum* F.Muell. Some of these, i.e. those from Rockhampton collected by Thozet (MEL), from between the Dawson and Burnett Rivers collected by Mueller (MEL) and from Port Molle and from Port Denison collected by Fitzalan (BM, MEL), have keeled stipules which are attenuated into a folded lobe at the apex, slender glabrous inflorescences and small to medium-sized glossy leaf blades. These resemble specimens of *Psydrax odorata* from the Pacific Islands and are therefore referred here to that species. The remainder of the syntypes, i.e. Brisbane River and Pine River collected by Hill and Mueller, Brisbane River collected by Mueller (MEL, K), and Wide Bay collected by C. Moore (MEL), have stipules which are neither keeled nor lobed at the apex, robust hairy inflorescences and comparatively large leaf blades.

Thus, we believe two discrete taxa are represented by the syntypes of Mueller's *Canthium lamprophyllum*, namely (1) a taxon with stipules which are keeled and lobed at the apex, slender glabrous inflorescences and small or medium-sized shiny leaf blades, which is referrable to *Psydrax odorata*, and (2), a taxon with stipules which are without a keel and an apical lobe, robust hairy inflorescences and large leaf blades.

To fix the applicability of *P. lamprophylla* (F.Muell.) Bridson, Mueller's name is lectotypified here by the Mueller collection from near the Brisbane River, i.e., specimen MEL1538219 in MEL. An isolectotype is present in K and also in MEL (MEL1538225). The lectotype, which is in flower, is the best of the syntypes of Mueller's *Canthium lamprophyllum* seen in this study. It also has the hairy inflorescences described in Mueller's protologue (which is not the case in the syntypes referrable to *Psydrax odorata* which have glabrous inflorescences). Thus lectotypified, Mueller's name applies to the second taxon represented by the above syntypes which is, we believe, specifically distinct from *P. odorata*.

Variability: *Psydrax lamprophylla* varies consistently in its leaves and fruits. On this basis, two forms are formally recognised here.

Key to forms of *Psydrax lamprophylla*

1. Petioles 1.0–3.0 cm long; leaf blades usually narrow at base and attenuate into the petiole; lateral nerves usually oblique; reticulate venation prominent; corolla 3.5–4.5 mm long; fruits 5.0–5.5 mm long × (4.0–) 7.0–7.5 mm wide; pyrenes usually slightly rugose . . . . **7a. P. lamprophylla** forma **lamprophylla**

   Petioles 0.4–1.8 mm long; leaf blades usually broad at base, with the base obtuse or subcordate; lateral nerves widely spaced, patent or suboblique; reticulate veins usually obscure; corolla 4.5–6.5 mm long; fruits 7.0–8.0 mm long × (0.8–) 1.0–1.2 cm wide; pyrenes usually exceedingly rugose . . . . **7b. P. lamprophylla** forma **latissima**

7a. P. lamprophylla forma lamprophylla

Stipules truncate; leaf blades (8.5–) 10.5–13.5 cm long × (3.1–) 4.0–5.2 cm wide, usually narrowed at both ends, attenuate at base into a petiole up to 3.0 cm long, or the base obtuse; surfaces usually dotted with insect galls; lateral nerves usually exceedingly oblique, with prominent cross veins and reticulate veins between them; main peduncles 1.3–3.5 cm long; corolla tube 1.5–2.0 mm long × *c.*1.5 mm wide; fruits didymous, 5.0–5.5 mm long × 7.0–7.5 mm wide, or rarely 1-lobed then *c.*5.0 mm long × 4.0 mm wide, smooth; pyrenes rugose.

***Additional representative specimens*: Queensland.** PORT CURTIS DISTRICT: Bulburin State Forest, 24°3-'S, 151°2-'E, Apr 1980, *McDonald* 3162, *Fisher & Ryan* (BRI); Mount Atherton, 22°46'S, 150°45'E, Dec 1992, *Melzer* 63 (BRI); Brolga Mine, Glen Geddes, 23°01'S, 150°18'E, May 1993, *Batianoff* 930539, *Specht & Reeves* (BRI); State Forest 69, 24°38'S, 150°53'E, 33.9 km NW of Monto, Mar 1996, *Halford* Q2808 (BRI). BURNETT DISTRICT: Mill North Logging Area, State Forest 95, 3 km N of Kalpowar, Aug 1984, 24°4-'S, 151°1-'E, *Grant* s.n. (BRI). WIDE BAY DISTRICT: Kin Kin, 26°16'S, 152°53'E, Jan 1916, *White* s.n. (BRI); Dundowran, Jul 1928, *Tryon* s.n. (BRI); Fraser Island, 25°15'S, 153°20'E, May 1964, *Webb & Tracey* 6345 (BRI); Pine Mountain, S of Biggenden, 25°—'S, 152°—'E, Mar 1980, *Young & Randall* 342 (BRI); Vicinity of Fairlies Knob, 25 km E of Biggenden, 25°30'S, 152°18'E, Jul 1981, *Young & Randall* 392 (BRI); Kenilworth Bluff about 8 km N of Kenilworth, 26°32'S, 152°43'E, May 1987, *Sharpe* 4683 & *Bean* (BRI); 1 km N of Mt Mittarula, SW of Gympie, 26°18'S, 152°32'E, Oct 1993, *Bean* 6720 (BRI). MORETON DISTRICT: Moreton Bay, in 1872, *Eaves* s.n. (MEL); Benarkin, Apr 1924, *Cameron* s.n. (BRI); Indooroopilly, Brisbane, Apr 1936, *Cribb* s.n. (BRI); Yarraman, Aug 1957, *McGillivray* [NSW193674] (NSW); Palen Creek State Forest near Mt Lindesay, 28°20'S, 152°45'E, Nov 1993, *Grimshaw* 102 (BRI). **New South Wales.** Ballina, Jul 1893, *Bauerlen* s.n. (NSW); ditto, Feb 1894, *Bauerlen* s.n. (NSW, K); Brunswick River, Pacific Highway, May 1964, *Schodde* 3552 & *Hayes*

(CANB, NSW); 3 km S of southern edge of Broken Head, Feb 1981, *Williams* s.n. (NSW); Tweed River, date unknown, *Moore* s.n. (MEL [MEL1538240], K, NSW).

***Distribution and habitat*:** Central and south-eastern Queensland to far northern New South Wales; usually in dry rain forests on hill crests, slopes, gullies and along creeks, on red brown soil. (**Map 7**)

***Notes*:** The specimens from Bulburin State Forest and Dundowran have broad leaves with a broad base, but short petioles as in *P. lamprophylla* forma *latissima*. However, they differ from that in their aspect and venation. Specimens which are sterile appear to represent young growth of this form.

7b. P. lamprophylla forma **latissima** S.T.Reynolds & R.J.F.Hend., **forma nov.** a *P. lamprophylla* forma *lamprophylla* foliorum laminis latis basi lata praeditis, petiolis brevioribus (12.0–18.0 mm longis) inflorescentiis robustioribus et pyrenis valde rugosis differt. **Typus**: Queensland. North Kennedy District: about 7 km W of Paluma, 19°0-'S, 146°0-'E, 20 July 1986, *G. Duff* 18 (holo: BRI).

[*Plectronia diococca* auct. non (Gaertn.) F.Muell.: F. Mueller, *Fragm.* 9: 185–186 (1875) quoad specimini Rockingham Bay, [leg.] *Dallachy*].

[*Canthium cymosum* auct. non Pers.: F. Mueller, *Fragm.* 9: 185 (1875), *Syst. census Austral. Pl.* 75 (1882) & *Second syst. census Austral. Pl.* 126 (1889)]

[*Canthium didymum* auct. non C.F.Gaertn.: F. Mueller, *Fragm.* 9: 185 (1875) et F.M. Bailey, *Qld Fl.* 3: 764 (1900) quoad specimini Rockingham Bay, [leg.] *Dallachy*.]

Stipules truncate or very rarely with a vestigial apical lobe; petioles (0.4–) 1.2–1.8 cm long; leaf blades (9.5–) 12.0–18.0 (–20.0) cm long × (5.1–) 6.0–8.7 (–9.7) cm wide, with apex abruptly short acuminate, subobtuse or obtuse, and usually truncate, subcordate, slightly rounded or obtuse and shortly attenuate into petiole proximally; lateral veins widely spaced with reticulate veins obscure; domatia 1 or 2 on each side of midrib, sometimes absent; main peduncles 1.5–3.0 cm long, hairy, robust, with minute denticulate bracts towards the middle or towards the base, thickened from the bracts to its base; inflorescences branches bifurcate, 8.0–12.0 mm long; cymes about 23-flowered; pedicels finely hairy, those of solitary flowers 3.0–6.0 mm long, of others 1.5–3.0 mm long; calyx finely puberulent; corolla tube broad campanulate, 2.5–3.5 mm long × 2.5–3.0 mm wide, puberulent abaxially, densely reflexed hairy at throat; lobes somewhat elliptic, 2.0–3.0 mm long, obtuse; fruits 2-lobed, transversely ellipsoid, slightly compressed, 7.0–8.0 mm long × 8.0–12.0 mm wide; endocarp slightly resinous, usually with a red glandular layer below the pericarp; pyrenes strongly rugose.

***Additional representative specimens*: Queensland.** Cook District: Leo Creek, upper Nesbitt River, 13°45'S, 143°25'E, Aug 1948, *Brass* 19899 (BRI, K); Upper Parrot Creek, Annan River, 15°45'S, 145°15'E, Sep 1948, *Brass* 20299 (BRI, K); Big Tableland Logging Area, about 27 km S by E of Cooktown, 15°45'S, 145°17'E, Sep 1960, *Smith* 11206 (BRI, K); Lankelly Creek (13°55'S, 143°20'E), Sep 1971, *Hyland* 5412 (BRI, K, QRS); State Forest Reserve 144, Windsor Tableland, 16°30'S, 145°05'E, Oct 1971, *Hyland* 5558 (BRI, K, QRS); State Forest Reserve 607, Bridle Logging Area, 17°00'S, 145°35'E, near Mareeba, Apr, 1972, *Irvine* 184 (BRI, K, QRS); Leo Creek Road, 13°40'S, 143°20'E, Jul 1972, *Hyland* 6365 (BRI, QRS); Timber Reserve 146, Tableland Logging Area, 15°45'S, 145°15'E, near Rossville, N of Mt Finnegan, Jul 1975, *Hyland* 8330 (BRI, QRS); State Forest Reserve 144, 16°17'S, 145°,05'E, W of Daintree, Apr 1976, *Hyland* 8732 (BRI, CANB, K, QRS); Moa Island, Torres Strait, 10°11'S, 142°15'E, May 1987, *Budworth* 1264 (BRI). North Kennedy District; Gregory Creek, near Proserpine, Dec 1993, *Perry* s.n. (BRI); Portello's Crossing, Dryander Creek, base of Mt Dryander, 20°16'S, 148°35'E, Feb 1994, *Forster* PIF14858 (BRI); Rockingham Bay, date unknown, *Dallachy* s.n. (MEL)*[6]. South Kennedy District: Finch Hatton Gorge, Eungella National Park, 21°09'S, 148°38'E, Jan 1991, *Pearson* 432 (BRI).

***Distribution and habitat*:** Northern Queensland, from Torres Strait, Cape York Peninsula to near Eungella; on steep slopes and gullies, near permanent water at altitudes of 400–1100 m, in wet or dry rainforests, usually with *Agathis robusta*, on soils derived from granite. (**Map 7**)

***Diagnostic attributes*:** *Psydrax lamprophylla* forma *latissima* may be distinguished from the typical form by the broad base of its leaf laminas which are very broad obtuse or truncate, widely spaced lateral nerves with obscure reticulate veins, robust peduncles, larger flowers and fruits with very rugose pyrenes.

Notes**:** Dallachy's collection from Rockingham Bay cited above (*6) was included under *Plectronia diococca* (Gaertn.) F.Muell. by Mueller (1875), when making the new combination, and under *Canthium didymum* C.F.Gaertn. (as 'Roxb.') by Bailey (1900). These names are now considered synonyms and the species they relate to does not occur in this region (Bridson 1985, p.687).

Etymology**:** The forma epithet *latissima*, Latin for 'very broad', refers to the broad leaf blades with a broad base present in this form of the species.

8. Psydrax laxiflorens S.T.Reynolds & R.J.F.Hend., **sp. nov.** quoad folia *P. lamprophyllae* (F.Muell.) Bridson simile sed stipulis carinatis inflorescentiis laxis, ramis paucioribus constructis, floribus fructibusque majoribus, pedicellis longioribus differt. **Typus:** Queensland. Cook District: Herberton Range, 17°30'S, 145°30'E, 19 November 1929, *S.F. Kajewski* 1377 (holo: BRI; iso: K, MEL, NSW).

Canthium sp. (Herberton Range S.F.Kajewski 1377), S.T. Reynolds (1997, p.180), P.I. Forster & D.A. Halford (2002, p.174).

Trees 10–20 m high; trunk to *c*.25 cm dbh, fluted and buttressed; bark flakey; branchlets glabrous, usually with ± globose or irregular shaped lenticels. **Leaves** opposite; stipules broad ovate, 2.5–4.0 mm long, abruptly acuminate with a long folded lobe at apex; petioles 0.6–1.5 cm long, flexuose, slightly channelled adaxially; blades elliptic or elliptic-ovate, (6.0–) 8.0–9.0 (–10.5) cm long × (3.0–) 4.0–6.0 (–6.3) cm wide, with apex and base obtuse or with apex abruptly shortly acuminate and base subacute or subtruncate, glabrous, thin coriaceous, shiny adaxially; lateral nerves in 3–5 pairs, very slender, arcuate, looping distally; reticulate venation very fine, open; domatia conspicuous, 1 or 2 on each side of the midrib, very rarely absent. **Inflorescences** open, very laxly branched and flowered, 2.5–4.0 cm long × 3.5–4.5 cm across, 6–20-flowered; peduncles glabrous, the basal one 3.0–16.0 mm long with small bracts near its distal end; axis branches 8.0–14.0 mm long, bifurcate, each terminated by a 3–7-flowered cymule, the solitary flower at forks of the dichotomous branches often absent. **Flowers** 5-merous, strongly scented; pedicel of solitary flowers 7.0–10.0 mm long, of others 5.0–7.0 mm long; calyx 2.0–2.5 mm long, glabrous, with tube ± turbinate and limb 5-denticulate; lobes ovate; corolla 6.0–8.0 mm long, cream-yellow or yellow; tube broad campanulate, 2.0–3.0 mm long, densely hairy at the throat; lobes elliptic, 4.0–5.0 mm long × *c*.1.5 mm across, obtuse and ± incurved at apex, thick, papillose at margins, longer than tube, recurved; stamens shorter than tube plus lobes; filaments erect, *c*.1.5 mm long; anthers erect or reflexed, *c*.3.0 mm long, apiculate; style (with stigma) 8.0–9.0 mm long; stigma oblong, 2-lobed at apex. **Fruits** obovoid, 13.0–15.0 mm long × 8.0–10.0 mm across; pyrenes ellipsoid, exceedingly rugose.

Additional representative specimens**: Queensland.** Cook District: Davies Creek, Lamb Range, between Mareeba and Kuranda, 16°55'S, 145°35'E, in 1962, *Webb & Tracey* 7377 (BRI); State Forest Reserve 194, about 6 km WSW of Atherton, 17°17'S, 145°26'E, Nov 1974, *Hyland* 7868 (BRI, K, QRS); ditto, Mar 1976, *Moriarty* 2022 (BRI, QRS); ditto, Dec 1978, *Sanderson* 1601 (BRI, QRS); State Forest Reserve 607, Emerald Logging Area, SE of Mareeba, 17°05'S, 145°35'E, Apr 1979, *Gray* 1370 (BRI, NSW, QRS); Bartle Frere, Boonjie Logging Area, 17°23'S, 145°45'E, Nov 1991, *Hyland* 14312 (QRS). North Kennedy District: Paluma village, near police station, 19°00'S, 146°12'E, Dec 1984, *Jackes* 5 (BRI).

Distribution and habitat**:** Northern Queensland from the Atherton Tableland to Paluma Range; mostly on ranges in mountainous country, in vine forests at altitudes of 720–1220 m. **(Map 5)**

Diagnostic attributes**:** *Psydrax laxiflorens* is readily distinguishable by its comparatively large obovoid fruits, very loosely branched, sparsely-flowered inflorescences with slender branches and 2–7-flowered cymules with 5-merous flowers that are densely hairy at the mouth of the corolla tube, and prominent domatia on its leaf blades. In respect to leaves, it is similar to *P. lamprophylla* (F.Muell.) Bridson but differs from that with its keeled stipules, lax inflorescences with fewer branches and bigger flowers and fruits on longer pedicels. It is closely related to *P. odorata*, under which this taxon was previously included, but *P. odorata*, especially *P. odorata* subsp. *australiana* which occurs in the same area, differs from *P. laxiflorens* in its compact inflorescences, ellipsoid fruits 5.0–6.0 mm long × 3.0–7.0 mm across, and usually 4-merous flowers which are only sparsely hairy at the mouth of the corolla tube.

***Etymology*:** The specific epithet *laxiflorens*, from Latin *laxus*, 'loose', and *florens*, 'flowering', refers to the laxly branched, open inflorescences in this species.

9. Psydrax tropica S.T.Reynolds & R.J.F.Hend., **sp. nov.** *P. lamprophyllae* (F.Muell.) Bridson simile sed stipulis acuminatis carinatis, petiolis brevioribus, foliorum lamina ± membranaceiore nervis et venis reticulatis pertenuibus praedita differt. **Typus:** Queensland. Cook District: State Forest Reserve 310, Upper Goldsborough Logging Area, 17 km SE of Little Mulgrave Township, 17°16'S, 145°47'E, November 1988, *L.W. Jessup* 1819, *G.P. Guymer & W.J. McDonald* (holo: BRI; iso: BRI).

Canthium sp. (Whitfield Range B.P.Hyland 1020); S.T. Reynolds (1997, p.181), P.I. Forster & D.A. Halford (2002, p.174).

Small trees to 10 m high; branchlets brown or reddish brown, quadrangular distally and usually resinous, glabrous. **Leaves** opposite; stipules conspicuous, broad ovate, 6.5–8.0 mm long, keeled, attenuated into a long folded lobe at apex, paler coloured and ± membranous at margins, those distal on branchlets resinous; petioles 0.3–0.7 (–0.9) cm long, slightly flattened, flexuose; blades elliptic, ovate-elliptic or elliptic-oblong, 10.0–14.5 (–18.0) cm long × 5.2–7.0 (–8.0) cm wide, abruptly narrowed at both ends, or the apex abruptly shortly acuminate (more or less caudate in young leaves) or subacute and the base obtuse or subacute and attenuate into short petiole; margins thick and slightly recurved; both adaxial and abaxial surfaces glabrous with the adaxial surface glossy, with prominent nerves and reticulate secondary venationed; lateral nerves in 4–8 (–9) pairs, obliquely arched and ascending and with a fine, delicate network of secondary veins between them, which is prominently raised in dried specimens; domatia present or very rarely absent. **Inflorescences** open with bifurcate branches, 4.0–5.0 cm long × 5.0–6.5 cm wide, (13–) 30–75-flowered; peduncles and pedicels sparsely short hairy, with main peduncles 1.5–2.3 cm long and secondary peduncles 4.0–11.0 mm long, bifurcate. **Flowers** 5-merous; pedicels slender, that of solitary flowers 2.5–5.0 mm long, of others 0.5–2.0 mm long; calyx 1.0–2.0 mm long, glabrous, with tube ± campanulate and 5-denticulate limb wider and paler coloured than tube, the lobes broad ovate; corolla 6.5–8.5 mm long; tube broad cylindrical, 1.0–3.5 mm long, to 1.5 mm wide at mouth, densely long hairy at throat; lobes erect or slightly spreading, elliptic, 2.5–5.0 mm long × 1.5–2.0 mm wide, obtuse but cucullate at apex, usually delicately reticulate veined; stamens usually as long as the corolla lobes; filaments erect, about 2.0 mm long, filiform; anthers 3.0–3.5 mm long, erect or sometimes ± recurved; style (with stigma) about 10.0 mm long; stigma oblong, 2-lobed at apex. **Fruits** transversely ellipsoid, about 8.0 mm long × 9.0 mm wide; pericarp verrucose when dry; pyrenes about 8.0 mm long × 5.0 mm wide, exceedingly hard and rugose.

***Representative specimens*:** **Queensland.** Cook District: Johnstone River, Mar 1916, *Michael* s.n. (BRI); The Boulders near Babinda, Jan 1967, *Rijkers* [NQNC14772] (BRI, QRS); Whitfield Range, Oct 1967, *Hyland* 1020 (QRS); Alexandra Creek, N of Thornton Peak, Jul 1973, *Webb & Tracey* 13220 (BRI, QRS); foot of MacAlister Range, 2.5 km ENE of Saddle Mountain, 16°49'S, 145°41'E, Dec 1987, *Lyons* 54 (BRI); State Forest Reserve 310, Upper Goldsborough Logging Area, 17 km SE of Little Mulgrave Township, 17°16'S, 145°47'E, Nov 1988, *Jessup* 1819, *Guymer & McDonald* (BRI).

***Distribution and habitat*:** North Queensland, from Thornton Peak to the Atherton Tableland; in vineforests, on gentle slopes, creek and river banks, usually on alluvium. (**Map 9**)

***Diagnostic attributes*:** *Psydrax tropica* is characterised by its usually large elliptic acuminate or subacute leaf blades with prominent, very fine, delicately arranged network of secondary veins, and by its ovate, keeled stipules with usually paler coloured thinner margins. It is related to *P. odorata* subsp. *australiana*, which has more or less similar attributes of the leaves and inflorescences, but that taxon differs from *P. tropica* by its usually smaller leaves which are up to 8.3 cm long and 4.4 cm wide, rarely more, and which have an obtuse or subacute apex and loosely arranged reticulate venation.

Etymology: The specific epithet *tropicus*, Latin for 'tropical', refers to the usual habitat of this species, namely the Wet Tropics of northern Queensland.

10. Psydrax banksii S.T.Reynolds & R.J.F.Hend., **sp. nov.** *P. suborbiculari* (C.T.White) S.T.Reynolds & R.J.F.Hend. arte simile sed foliorum lamina obovata ellipticave, basi anguste attenuata, venatione reticulata prominente, et inflorescentiarum pedunculis longioribus differt. **Typus**: Queensland. Cook District: Mouth of Jardine River, 10°56'S, 142°14'E, 2 February 1983, *A. Morton* AM1782 & *L. Hiddins* (holo: BRI; iso: MEL).

Canthium sp. (Friday Island L.J.Brass 18158), S.T. Reynolds (1997, p.180), P.I. Forster & D.A. Halford (2002, p.174).

Shrubs or small trees to 5 m high; branchlets ± angular and usually puberulous distally, lenticellate. **Leaves** opposite; stipules ovate or ± triangular, 4.0–6.0 mm long, keeled and attenuated into a long folded lobe distally; petioles (0.1–) 0.2.–0.4 cm long; blades obovate or subelliptic, 3.2–5.5 (–6.2) cm long × 1.6–3.0 (–3.6) cm wide, with apex rounded and base subacute or attenuate and decurrent into petiole, the margins flat or slightly recurved in dried specimens; adaxial and abaxial surfaces glabrous, the adaxial ones shiny, the abaxial ones dull, usually resin-dotted; lateral nerves in (2–) 4 or 5 pairs, oblique, ascending distally and looping at margins; reticulate veins loosely arranged, distinct or indistinct on adaxial surface; domatia small, usually few on each side of the midrib, sometimes absent. **Inflorescences** 6.0–9.0 cm long × 4.0–5.0 cm across, 27–59-flowered; peduncles slender, puberulous, the basal one (1.5–) 3.0–4.6 cm long; axis branches 7.0–14.0 mm long; cymes 12–15-flowered. **Flowers** 4(or 5)-merous; pedicels slender, puberulent, that of solitary flowers 4.0–8.0 mm long, that of others 1.0–4.0 mm long; calyx about 2.0 mm long; tube slightly turbinate, limb 4- or 5-denticulate; lobes broad ovate, minute; corolla 6.0–7.5 mm long; tube cylindrical or narrow campanulate, 2.0–2.5 mm long × *c.*1.0 across, sparsely hairy at throat; lobes recurved, sublanceolate, subacute or obtuse, 4.0–5.5 mm long × 1.0–1.25 mm across; stamens with filaments subulate, 1.0–2.5 mm long, erect; anthers 2.5–3.0 mm long; style (with stigma) 6.0–7.0 mm long, exserted; stigma oblong, shortly bilobed at apex. **Fruits** obovoid to ellipsoid, 0.9–1.0 cm long × 0.7–0.9 cm across, usually resin-dotted; endocarp thick, resinous; pyrenes ellipsoid or depressed ovoid, rugose. **(Fig. 5F–5K)**

***Additional representative specimens*: Queensland.** Cook District: Lizard Island, Aug 1770, *Banks & Solander* s.n. (BM); Torres Strait, Friday Island, 10°36'S, 142°10'E, Feb 1948, *Brass* 18158 (BRI); between Cape York and Galloway's Hill, Oct 1965, *Smith* 12540 (BRI); Olive River, 12°10'S, 143°05'E, Sep 1974, *Hyland* 7447A (BRI); Starke–Cape Flattery Road, Jul 1976, *Tracey* 14579 (BRI); Morgan River, 15°06'S, 145°14'E, Jan 1979, *Duke* 1209 (BRI); Torres Strait, Badu Island, Jan 1980, *Garnett* 344 & 356 (BRI); coast S of Thorpe Point, Shelburne Holdings, 11°55'S, 143°08'E, Nov 1985, *Gunness* 1961 (BRI); Porn 2V, Parish of Annan, 15°36'S, 145°19'E, Dec 1988, *Hyland* 13773 (BRI); 0.8 km N of Captain Billy Landing, 11°37'S, 142°51'E, Mar 1992, *Clarkson* 9269 & *Neldner* (BRI); Lakefield National Park, 32.5 km from Laura on road to New Laura Homestead, 15°18'S, 144°25'E, Jan 1993, *Forster* PIF12819 & *Bean* (BRI); Evans Bay, 26 km NE of Bamaga, 10°42'S, 142°32'E, Feb 1994, *Fell* 3917, *Stanton & Roberts* (BRI); Cape York, date unknown, *Hill* s.n. (K). North Kennedy District: Hinchinbrook Island, 18°1-'S, 146°2-'E, Dec 1978, *Thorsbourne & Travers* 492 (BRI, K).

***Distribution and habitat*:** North Queensland, from Torres Strait Islands and Cape York Peninsula to Hinchinbrook Island; in coastal woodlands, heaths and vine thickets, mostly on sand dunes or sand hills. **(Map 8)**

***Diagnostic attributes*:** *Psydrax banksii* is characterised by its usually small, shiny, obovate, finely reticulate-nerved leaf blades, hairy, long-stalked inflorescences, and delicate flowers with a narrow, ± cylindrical corolla tube.

***Affinities*:** *Psydrax banksii* is closely related to *P. suborbicularis* (C.T.White) S.T.Reynolds & R.J.F.Hend. from Papua New Guinea with which it shares the slender inflorescences and corollas, but that species differs from *P. banksii* in its broad suborbicular leaf blades as indicated in the key to distingish the two below.

Leaf blades suborbicular with base truncate or subcordate and reticulate veins indistinct; inflorescences with main peduncle 2.0–2.5 cm long; corolla with tube 3.0–3.5 mm long, densely hairy at throat, and lobes 2.0–2.5 mm long . . . . **P. suborbicularis**

Leaf blades obovate with base narrowed and reticulate veins prominent; inflorescences with main peduncles (1.5–) 3.0–4.6 cm long; corolla with tube 2.0–2.5 mm long, sparsely hairy at throat, and lobes 4.0–5.5 mm long . . . . **P. banksii**

Notes: Though the majority of specimens of this species seen had the typical small obovate leaf blades, a few had somewhat larger leaves which approached those of *P. odorata*, but that species, especially in *P. odorata* subsp. *australiana*, which occurs in the same area as *P. banksii*, differs from *P. banksii* by its glabrous branchlets and inflorescence axes, short and stout pedicels, and fleshy corollas with a comparatively broad tube.

Etymology: The specific epithet *banksii* honours Sir Joseph Banks for his valuable contribution to Australian botany. He, with Daniel Solander, was the first (according to our records) to collect this species when visiting Lizard Island, off the north Queensland coast, in August 1770 during Captain Cook's voyage in the Endeavour.

11. Psydrax latifolia (F.Muell. ex Benth.) S.T.Reynolds & R.J.F.Hend., **comb. nov.**; *Canthium latifolium* F.Muell. ex Benth., *Fl. Austral.* 3: 421 (1867). **Type**: New South Wales. In the interior towards Barrier Range, date unknown, *Nielsen* s.n. (syn : MEL [MEL1538208]); NW interior, date unknown, *J. McDouall Stuart* s.n. (syn: n.v.).

Shrubs or small trees 2–5 m high with branches usually borne at right angles to the main stem; bark whitish to light or dark grey, usually finely fissured; branchlets reddish-brown and usually covered with a white bloom distally, sometimes swollen and galled (myrmecophilous); young branchlets and young leaves usually with short spreading hairs. **Leaves** opposite; stipules ± triangular, 5.0–7.0 mm long, keeled and attenuated into a long, apiculate, keeled lobe distally; petioles (0.2–) 0.5–1.2 cm long, stout, flattened, sometimes slightly winged by decurrent leaf blade; blades broad ovate or suborbicular, elliptic–ovate or elliptic, (3.6–) 5.0–7.0 (–8.5) cm long × (3.0–) 4.2–6.0 (–8.7) cm wide, with apex rounded, obtuse or truncate, base subcordate, obtuse or abruptly obtuse and attenuate into the petiole, and margins entire or slightly wavy (in young leaves), glabrous, or slightly scabrid on adaxial surface, coriaceous, usually exceedingly so and rigid, with the raised nerves and dense reticulate venation rendering the blade very stiff when dry, pale or dull green, drying yellowish-green, yellowish-brown or brown; lateral nerves in (4–) 5–9 pairs, conspicuous, obliquely arched and ascending, usually looping at margins; sceondary veins closely reticulate, usually conspicuous on both surfaces. **Inflorescences** shorter than leaves, 2.2–4.5 cm long × 2.5–4.5 cm wide, usually shortly stalked and trichotomously branched; peduncles glabrous or sparsely hairy, the basal one 3.0–12.0 mm long, with minute bracts towards its apex and terminated by 3 branched cymes; branches (3.0–) 9.0–25.0 mm long; flowering branches 3.0–6.0 mm long; cymules 14–41-flowered. **Flowers** 4(or 5)-merous; pedicel of solitary flowers 2.5–6.0 mm long, of others 1.0–3.0 mm long; calyx 0.5–2.0 mm long, with tube ± turbinate, 0.25–0.75 mm long, and limb thin, ± scarious, 4(or 5)-toothed; lobes ovate, to 0.5 mm long, glabrous or with tufts of hairs at the apex; corolla 5.5–8.0 mm long, with tube shorter than the lobes, ± campanulate, 1.5–3.0 mm long, sparsely hairy at throat; lobes subelliptic, 3.5–4.5 mm long, obtuse, occasionally papillose outside, erect or recurved; disc shorter than the calyx limb, glabrous; stamens nearly as long as the corolla lobes; filaments 0.5–2.0 mm long; anthers 2.0–3.0 mm long, usually erect; style (with stigma) 7.0–10.0 mm long, slightly exserted from corolla tube; stigmatic knob oblongoid, 2-lobed at apex. **Fruits** obovoid or broad ellipsoid, slightly laterally compressed, 0.5–0.9 cm long × 0.6–1.2 cm wide, black and shiny when ripe; pyrenes ellipsoid, very deeply rugose on the dorsal side. **(Fig. 5A–5E)**

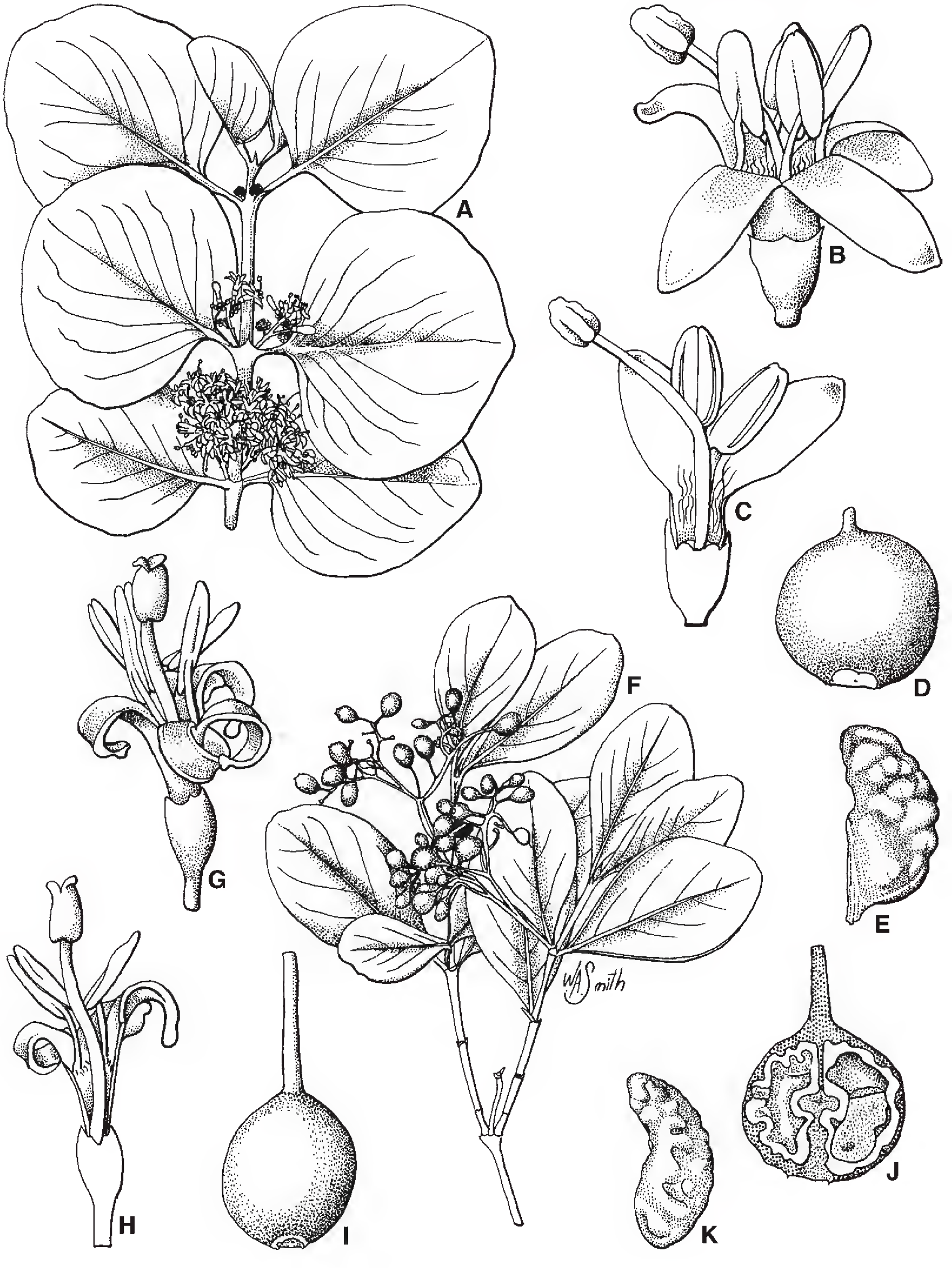

Fig. 5. ***Psydrax latifolia***. A. flowering branch × 0.6. B. flower × 6. C. LS of flower × 6. D. fruit × 3. E. pyrene × 4. A–C, *Nelson* 1818 (DNA); D&E, *Willis* [MEL 1538609] (MEL). ***Psydrax banksii***. F. fruiting branch × 0.6. G. flower × 6. H. LS of flower × 6. I. fruit × 3. J. LS of fruit showing embryo × 4. K. pyrene × 4. F,I&K, *Clarkson* 9649 & *Neldner* (BRI); G&H, *Morton* AM1782 & *Hiddins* (BRI); J, *Brass* 18158 (BRI).

***Additional representative specimens*: Western Australia.** 6 miles (*c*.9.6 km) E of Willenom Gorge, Apr 1952, *Broadway* s.n. (PERTH); 65 miles (*c*.104 km) E of Leonora (28°5-'S, 120°2-'E), May 1959, *Vollprecht* 16 (PERTH); 3 miles (*c*.4.8 km) S of Meekatharra, Oct 1965, *Blockey* 12 (PERTH); Dale's Gorge between Millstream and Willenom (21°—'S, 117°—'E), Nov 1968, *Young* 159 (CANB); Stony Creek, 1 mile (*c*.1.6 km) S of Meekatharra (26°36'S, 118°29'E), Aug 1976, *Demarz* 6088 (PERTH); Doolgunna Homestead (25°01'S, 119°13'E), Dec 1983, *Mitchell* 1179 (PERTH); 16 km N of Two Sisters about 130 km SE of Shay Gap (21°—'S, 121°—'E), Jul 1984, *Newbery* 10378 (PERTH). **Northern Territory**. 8 miles (*c*.12.8 km) E of Haast's Bluff, MacDonnell Ranges, May 1911, *Hill* 176 (MEL); Idracowra (25°00'S, 133°47'E), May–Sep 1920, *Basedow* s.n. (AD)*[7]; MacDonald Downs (22°25'S, 135°07'E), Aug 1933, *Ising* s.n. (AD)*[7]; 5 miles (*c*.8 km) NNE of Barrow Creek Township, Aug 1956, *Lazarides* 5820 (AD, BRI, DNA, K, PERTH); Reedy Creek, George Gill Range, May 1962, *Madden* 10372 (DNA); Bagot Springs, George Gill Range, Jul 1966, *Willis* s.n. (MEL); 60 miles (*c*.96 km) NW of Alice Springs, just outside Desert Block (23°00'S, 133°13'E), Jan 1967, *Latz* 34 (DNA); Stuart Highway, 5 miles (*c*.8 km) S of Tea Tree (22°12'S, 133°26'E), Feb 1968, *Maconochie* 573 (DNA); No 1 Desert Bore, Amburla Station (23°20'S, 133°10'E), Jan 1969, *Nelson* 1818 (DNA, K); Docker River, Nov 1970, *Woenne* 108 (PERTH); Marque Station (22°58'S, 137°40'E), May 1972, *Dunlop* 2597 (DNA); Ormiston Gorge (23°37'S, 132°43'E), Feb 1973, *Griffin* 346 (DNA); New Crown Station, Beddome Range (25°52'S, 134°28'E), Apr 1977, *Henshall* 1525 (CANB); Yuendumu, 5 km N of Ngana Outstaion (22°25'S, 131°30'E), Feb 1981, *Henshall* 3332 (DNA); The Granites Tenements, Tanami Desert (20°32'S, 130°18'E), Dec 1984, *Kalotas* 1771 (DNA). **South Australia**: Lake Eyre Basin, Alberga River, 20 miles (*c*.32 km) W of Todmorden, Apr 1950, *Black* s.n. (AD); Tomkinson Range, Mt Davies area (26°13'S, 129°16'E), Jan 1956, *South Australia Pastoral Board* (AD). **Queensland.** Gregory North District: Ardmore, 25 miles (*c*.40 km) W of Dajarra, 21°39'S, 139°11'E, Nov 1947, *Everist* 3218 (BRI); about 1 km W of Lark Quarry, 23°03'S, 142°20'E, Oct 1989, *White* s.n. (BRI); about 29 km N of Pathungra, 22°07'S, 140°34'E, May 1993, *Gunness* 2155 (BRI); 40 km E of Bedourie, date unknown, *Pulsford* 598 (BRI). Mitchell District: 17 km NW of Withywene Homestead, NW of Stonehenge, 23°44'S, 143°19'E, Apr 1986, *Neldner* 2345 & *Stanley* (BRI). Gregory South District: between Nockatunga and New South Wales border, Mar 1924, *Allison* s.n. (AD, BRI); Morney Station, 25°22'S, 141°28'E, Aug 1973, *Trapnell* & *Williams* 223 (BRI); Nockatunga, 27°43'S, 142°43'E, Apr 1977, *Hughes* s.n.(AD)*[7]; 50 km N of Orientos homestead, 24°4-'S, 141°1-'E, Oct 1980, *Bolton* 116 (BRI). Warrego District: Wittenburra Station, 36 miles (*c*.57.6 km) S of Eulo, 28°35'S, 144°45'E, Jan 1937, *Everist* & *Smith* 50 (BRI); Dynevor Downs, 28°05'S, 144°21'E, Apr 1941, *White* 11821 (BRI); about 30 km N of Thargomindah, Jun 1955, *Smith* 6348 (BRI); Grey Range, 79 km W of Thargomindah, 27°35'S, 143°15'E, Oct 1980, *Bolton* MPB64 & *Ashwell* (BRI). **New South Wales**. Main Barrier Range, Mootwingee, about 110 km NE of Broken Hill (31°17'S, 142°18'E), Aug 1962, *Jackson* 390 (AD)*[7]; Peery Hills, Wilcannia (31°34'S, 143°2-'E), Sep 1976, *Cunningham* 4824 & *Milthorpe* (NSW); Brindingabbe via Bourke (29°00'S, 144°54'E), Oct 1983, *O'Neill* s.n. (NSW).

***Distribution and habitat*:** Central Australia; in low woodlands with *Eucalyptus* spp. and/or Mulga (*Acacia aneura* F.Muell. ex Benth.: Mimosaceae) on a variety of soils but mostly in red sandy soil, on sandy plains, ridges and slopes. (**Map 9**)

***Diagnostic attributes*:** *Psydrax latifolia* is readily recognisable by its very stiff, broad ovate, suborbicular or elliptic leaf blades with very conspicuous nerves and reticulate veins, its comparatively small inflorescences, its usually 4-merous flowers, and by its hairy or glabrous, reddish brown usually robust young branchlets (which mostly turn pale to dark grey with age).

***Affinities*:** *Psydrax latifolia* is closely related to *P. ammophila*, with which it shares the branchlet colour and attributes of the inflorescences and flowers, but that species differs from *P. latifolia* in its usually narrow bases of its leaf blades which have a finer reticulate venation, and the presence of a small domatium on some leaves of the branchlet. These species, however, are connected by integrades so that more field collections and notes are necessary before the total variability of each of these species can be fully understood.

P. latifolia also intergrades into *P. attenuata* and *P. oleifolia* so that it is sometimes difficult to delimit those species as well.

***Notes*:** *Psydrax latifolia* varies greatly in the shape and size of its leaf blades and in the prominence of its reticulate venation. Two forms are distinguishable in the specimens available for study, but they are not formally recognised here because of the presence of so many intermediate specimens. However, these forms are generally as follows.

The 'large-leaved' form. The majority of specimens of this species from central Western Australia, Northern Territory and South Australia examined usually have comparatively large leaf blades which are broad elliptic, broad ovate or suborbicular in shape, are broad and truncate apically, and are subcordate or obtuse at base. These leaf blades have very conspicuous lateral nerves and secondary reticulate veins, are glabrous or slightly scabrid on both surfaces, and are exceedingly pale brown or yellowish brown when dry.

The 'Barrier Ranges' form. Specimens of this species from New South Wales and south-western Queensland examined usually have comparatively smaller, mostly elliptic leaf blades which are usually abruptly obtuse apically, and are narrowed proximally into the petiole. They have comparatively much finer lateral nerves and reticulate venation, and they dry a brownish color. These specimens, especially those indicated by *[7] in the list above, closely resemble the syntype of *P. latifolia* from the Barrier Ranges cited above.

Although both forms are recorded from a variety of habitats, the 'Barrier Ranges' form is found mostly in rocky situations, whereas the 'broad leaf' form usually occurs on sandy flats, plains or ridges usually in red loamy soil. However, both forms sometimes grow in the same area where they are connected by intermediate specimens, for example, ones with large, wide leaf blades but with much finer lateral nerves and secondary reticulate venation, or by specimens with comparatively smaller leaf blades with coarse conspicuous lateral nerves and secondary venation. The existence of such specimens indicates that these forms need futher study before they can be satisfactorily delimited.

The branchlets of this species are sometimes swollen due to insects living in their tissues.

Uses: Fruits of *Psydrax latifolia* are reported by collectors to be edible.

12. Psydrax ammophila S.T.Reynolds & R.J.F.Hend., **sp. nov.** foliis latis nervatione prominenti ornata *P. latifoliae* (F.Muell. ex Benth.) S.T.Reynolds & R.J.F.Hend. simulans autem foliorum base angusta, venatione reticulata obscura differt. **Typus**: Queensland. GREGORY NORTH DISTRICT: 17 miles (*c.*27.2 km) ENE of Headingly Station, 21°—'S, 138°—'E, 18 May 1948, *R.A. Perry* 848 (holo: CANB; iso: BRI, DNA, K, PERTH).

Canthium sp. (Headingly Station R.A.Perry 848), P.I. Forster & D.A. Halford (2002, p.174).

Shrubs or small trees 1–5 m high, sometimes multistemmed; bark light grey; branchlets glabrous, stout, terete, the young ones reddish brown, the older ones dark grey. **Leaves** opposite; stipules ovate-triangular, keeled and attenuated into a folded lobe distally; petioles (0.4–) 0.8–1.3 cm long, usually slightly winged by decurrent leaf blade; blades elliptic or elliptic-ovate, 5.2–7.0 (–8.5) cm long × 2.6–3.5 (–4.8) cm wide, with apex and base obtuse or subacute, thick coriaceous, rigid; both surfaces glabrous, dark green, drying yellowish green or pale brown with age; lateral nerves in (3–) 4–6 pairs, obliquely arched, usually looping at margins, prominent on adaxial surfaces; reticulate venation fine, loosely arranged, prominent on adaxial surfaces but not visible abaxially; domatia absent or if present, then only on one or two leaves of a branchlet where 1 or 2 occur on each side of the midrib, obscure. **Inflorescences** shorter than the leaves, 2.2–3.5 cm long × 2.2–3.5 cm wide, 26–32-flowered; main peduncle 7.0–12.0 mm long, with minute bracts towards the middle or at the distal end, terminated by 2 or 3 branched cymes. **Flowers** comparatively small, 4-merous; pedicels of solitary flowers 2.0–3.5 mm long, of others 0.5–2.0 mm long; calyx 1.5–2.0 mm long; limb denticulate; corolla 5.0–6.5 mm longwith tube campanulate, 1.5–3.0 mm long, sparsely or densely hairy at the throat; lobes subelliptic, 2.5–4.5 mm long, obtuse, more or less cucullate at apex, papillose abaxially near apex; stamens with filaments 0.5–2.0 mm long and anthers 2.0–3.0 mm long; disc usually puberulous; style (with stigma) 6.0–7.5 mm long. **Fruits** broad ellipsoid, 5–8 mm long × 6–8 mm wide; pyrenes rugose.

***Additional representative specimens*: Western Australia.** *c.*5 km W of Gahnda Rockhole, Gibson Desert (26°36'S, 125°49'E), Apr 1982, *Kalotas* 1127 (DNA, PERTH). **Northern Territory**. between Mt Olga and Ayers Rock, Jun 1953, *Symon* 9434 (AD); No.2 Desert Bore, Hamilton Downs (23°31'S, 133°16'E), Sep 1955, *Chippendale* 1695 (BRI, NSW); Palm Valley (24°04'S, 132°43'E), Sep 1958, *Chippendale* 4895 (DNA); Wallenby Gorge area, George Gill Range, 1 mile (*c.*1.6 km) NE of Reedy Rock Hole (24°20'S, 131°41'E), Jul 1968, *Beauglehole* 26483 (MEL); 90 km W of Stewart Highway, Victory Downs (25°58'S, 132°21'E), Jul 1982, *Conrick* 779 (AD, DNA); Edmirringee Rockhole (20°36'S, 134°51'E), Sep 1983, *Halford* 83934 (DNA); 5 km NW of Mt Olga (25°18'S, 130°44'E), May 1985, *Bates* 5606 (AD); 4 km S of Finke (Apatula) (25°35'S, 134°35'E), Jun 1988, *Smith* 1180 (DNA); 14 km W of Waterloo Bore, Ti-Tree Station (22°09'S, 133°04'E), Jul

1992, *Latz* 12400 (DNA); 8 km NW of No.14 Bore, Georgina Station (20°56'S, 137°04'E), Sep 1992, *Latz* 12738 (DNA); 26 km NW of Barkly Homestead, Alyawarr Desert Survey Site 15 (19°37'S, 135°37'E), Apr 1993, *Parsons* 392 (DNA); 100 km N of Annitowa Homestead, Wakaya Desert (20°24'S, 136°13'E), May 1993, *Latz* 13085 (DNA); 50 km NNW of Kantju Gorge, Uluru (25°21'S, 131°02'E), Jul 1995, *Nelson* 2905 (DNA). **South Australia.** Upper Arkaringa Valley, Wa Wa Waterhole (Elder Expedition), May 1891, *Helms* s.n. (K, MEL; NSW); Mulgrave Ranges, Mulgrave Park about 55 km WNW of Mt Woodroffe, Jan 1964, *Lange* s.n. (AD); about 105 km NNW of Coober Pedy, Jun 1984, *Badman* 1096 (AD); Mt Crombie approx. 60 km SSW of Amata (26°38'S, 130°48'E), 26 Sep 1985, *Copely* 1409 (AD). **Queensland.** GREGORY NORTH DISTRICT: Oban Station, 60 miles (*c*.96 km) SW of Mt Isa, Woodend Bore, 21°—'S, 139°—'E, Nov 1938, *Everist* 1709 (BRI).

***Distribution and habitat*:** Central Australia, from Gibson Desert, Western Australia to western Queensland; on red sand plains or in rocky gullies or gorges, often near bores, on sandy soil. (**Map 14**)

***Diagnostic attributes*:** *Psydrax ammophila* is characterised by its usually broad, prominently nerved and finely reticulate-veined leaf blades which are sometimes provided with domatia, stout reddish coloured branchlets and comparatively small inflorescences with 4-merous flowers on short pedicels. However, this species is imperfectly known, it being represented in herbaria by mainly sterile collections with very variable leaves. Collection of more material is necessary to be certain of this species' characteristics.

***Affinities*:** *Psydrax ammophila* is related to *P. latifolia* and *P. attenuata* and some of the specimens cited above have previously been identified with those species or as an intergrade between them. It resembles the former species superficially in its leaves, branchlets, inflorescence and flowers, but *P. latifolia* differs from it by the usually broad base of its leaf blades, absence of domatia, much more conspicuous lateral nerves and reticulate venation and shorter petioles (see also the key to the *Psydrax latifolia* group above). These species however are sometimes connected by intergrades.

Psydrax attenuata may be readily distinguished from *P. ammophila* by its usually narrower leaf blades with fewer (2 or 3(or 4)) pairs of lateral nerves which are very oblique, longer petioles which are 7.0–22.0 mm long, slender reddish brown or grey branchlets, longer pedicels which are usually 8.0–11.0 mm long for solitary flowers, and 4- or 5-merous flowers.

***Notes*:** The following collections from south of Alice Springs were previously identified as *P. latifolia*, *P. attenuata* or as an intergrade between these species but are now considered to belong in *P. ammophila*. They differ from the former two species by their comparatively very small leaves, small inflorescences and small flowers. In addition, they are not typical of *P. ammophila* either and probably represent a distinct form of it or an intergrade between this species and *P. latifolia*. However, as the material available at present is too incomplete, it is not possible to be certain of the actual standing of these specimens. This taxon may be described as follows.

Branchlets stunted; leaf blades elliptic, *c*.3.2 cm long × 1.2 cm wide, subacute at both ends, efoveolate, finely reticulate-veined; inflorescences about 26-flowered with the main peduncle 3.0–7.0 mm long and with small bracts at its distal end; flowers 4-merous; pedicels 2.0–2.5 mm long (solitary flowers) or 0.5–1.5 mm long (other flowers); calyx *c*.1.5 mm long; corolla 5.0–6.0 mm long with tube 2.5–3.0 mm long, densely hairy at throat, and lobes 2.5–3.0 mm long, obtuse and slightly cucullate at apex, papillose above the middle; anthers 2.0–2.5 mm long on filaments 0.5–1.5 mm long; disc puberulous; and style with stigma 6.0–7.0 mm long.

Northern Territory: Deep Well Road, 23.5 miles (*c*.38 km) S of Alice Springs (24°05'S, 133°55'E), Oct 1964, *Nelson* 1366 (AD, BRI, NSW); *c*.37 km S of Alice Springs, Jul 1965, *Kuchel* 2285 (AD).

***Etymology*:** The specific epithet *ammophila*, from Greek *ammo-*, 'sand', and *-philus*, 'loving', refers to the sandy soil on which this species is usually found growing.

13. Psydrax reticulata (C.T.White) S.T.Reynolds & R.J.F.Hend., **comb. nov.**; *Plectronia odorata* var. *reticulata* C.T.White, *Proc. Roy. Soc. Qd.* 50: 78 (1939). **Type**: Queensland. COOK DISTRICT: Thursday Island, date unknown, *E. Cowley* 10 (holo: BRI).

Canthium sp. (Thursday Island E.Cowley 10), S.T. Reynolds (1997, p.181), P.I. Forster & D.A. Halford (2002, p.174).

Shrubs or small trees to 6 m high, usually stunted; bark grey, tessellated; branchlets brown or reddish brown, slightly 4-angular distally, glabrous. **Leaves** opposite; stipules subovate, 5.5–9.0 mm long, keeled and attenuated into a folded lobe distally; petioles 0.2–0.6 cm long; blades obovate or broad elliptic, (4.2–) 6.0–8.5 (–9.2) cm long × (3.0–) 4.4–6.2 (–7.3) cm wide, with apex and base slightly rounded, or apex retuse and base obtuse and shortly attenuate into petiole, coriaceous, slightly stiff when dry (due to prominent raised nerves and reticulate veins); both surfaces glabrous, the adaxial surface glossy, the abaxialy surface dull, usually slightly bullate between the nerves; lateral nerves in 4–8 pairs, obliquely arched and ascending, looping at margins, with secondary veins loosely reticulate, both lateral nerves and reticulate venation usually prominent on both surfaces (especially on dried specimens); domatia usually small, sometimes absent. **Inflorescences** 2.5–4.0 cm long × 4.5–6.0 cm wide, 24–44-flowered; peduncles stout, glabrous, the basal peduncle 1.0–2.0 cm long with minute bracts near its middle and terminated by 2-branched cymes; axis branches 0.8–2.5 cm long. **Flowers** 4-merous; pedicel of solitary flowers 2.5–6.0 mm long, that of others 1.0–3.0 (–4.0) mm long; calyx 1.5–1.7 mm long, with tube turbinate and limb 4-denticulate; corolla 4.0–5.0 mm long; tube broad campanulate, 2.0–2.5 mm long, with a ring of dense hairs at throat; lobes elliptic or ovate, 2.5–3.0 mm long × *c*.1.5 mm wide, obtuse and more or less cucullate distally, mostly recurved; stamens nearly as long as the corolla, exserted; filaments ± erect, *c*.1.0 mm long; anthers 2.0–2.5 mm long, erect or patent, slightly exserted; disc shorter than calyx limb, glabrous; style (with stigma) 6.5–8.0 mm long, exserted, ± sigmoid in younger flowers; stigma oblong with 2, small, slightly recurved lobes distally. **Fruits** (when didymous) transversely ellipsoid or (when 1-lobed) subglobose, 4.0–4.5 mm long × 4.5–7.5 mm wide, black when ripe; pyrenes hemispherical, rugose.

Additional representative specimens**: Queensland.** Cook District: Prince of Wales Island, Feb 1975, *Cameron* 20270 (QRS); Moa Island, Aug 1985, *Budworth* s.n. (BRI); Mt Bremer, 26.0 km NE of Bamaga, 10°42'S, 142°31'E, Feb 1994, *Fell* 3920, *Stanton & Roberts* (BRI); 26.7 km NE of Bamaga, 0.7 km N of Mt Bremer summit, 10°41'S, 142°32' E, Feb 1994, *Fell* 4048 & *Stanton* (BRI); Hammond Island, date unknown, *Heatwole & Cameron* 254 (QRS).

Distribution and habitat**:** North Queensland from Bamaga, Cape York Peninsula and Torres Strait Islands; chiefly on steep hill and gully slopes and creek banks close to the coast, on sandy soil at the fringe of semi-deciduous vine thickets (e.g. Pajinka Scrub near Bamaga). **(Map 6)**

Diagnostic attributes**:** *Psydrax reticulata* is readily recognisable by its shortly stalked, comparatively broad, shiny, usually foveolate leaves with prominent nerves and reticulate venation. It resembles *Psydrax latifolia* in its leaves, but that species differs from it by having stiffer, dull leaves which lack domatia. It also resembles *P. suborbicularis* from Papua New Guinea because of its leaves, but that species usually has comparatively small leaves with a finer, less distinct reticulate venation, and hairy inflorescences.

Notes**:** *Psydrax reticulata* is accepted here at specific rank because of its distinctive, comparatively large, broad, conspicuously reticulate-veined leaf blades which clearly distinguishes it from *P. odorata* under which (as *Plectronia odorata*) C.T. White described it at varietal level in 1939. In *Psydrax odorata*, the leaf blades are usually thicker, more glossy and have fewer primary nerves, and their reticulate venation is more open and less obvious.

14. Psydrax pallida S.T.Reynolds & R.J.F.Hend., **sp. nov.** foliis latis nervatione prominent reticulatoque ornatis *P. reticulatae* (C.T.White) S.T.Reynolds & R.J.F.Hend. simulans autem foliorum base angusta, petiolis longis differt. **Typus**: Queensland. Cook District: Dixie Station, 15°03'S, 143°27'E, 1 December 1994, *S.T. Garnett* 1545 (holo: BRI).

Canthium sp. (Dixie Station S.T.Garnett 1545), S.T. Reynolds (1997, p.180), P.I. Forster & D.A. Halford (2002, p.174).

Shrubs or small trees 3–5 m high; bark smooth, exceedingly pale grey or almost white and blotched; branchlets greyish–white or very pale brown, usually with scattered small lenticels, the older ones with pale grey, finely tessellated bark. **Leaves** opposite; stipules deltoid, keeled and attenuate distally into a usually long, folded decurrent lobe; petioles 2.0–3.0 cm long, flexuose; blades broad elliptic, elliptic–obovate or elliptic, 5.0–9.0 cm long × 2.5–5.0 cm broad, with apex obtuse or slightly rounded and base subacute or acute and attenuate into the long petiole, coriaceous with both surfaces glabrous and often slightly rough, rigid, drying yellowish green; lateral nerves and reticulate veins very conspicuous (raised on adaxial surface in dried specimens); lateral nerves in 3–5 pairs, obliquely arched and ascending towards the apex and looping near the margins, or nerves sometimes very oblique and ascending; tertiary veins ± closely reticulate, obscure below; domatia small, usually a few occurring on each leaf. **Inflorescences** with spreading branches, 12–40-flowered; peduncles glabrous, sometimes slightly resinous, the basal one 3.0–15.0 mm long with small bracts and usually three branches at its distal end; branches 0.6–1.8 cm long, terminated by 5–18-flowered cymes. **Flowers** 4(rarely 5)-merous; pedicel of solitary flowers (4.0–) 7.0–10.0 mm long, that of others 2.0–4.0 mm long; calyx about 1.5 mm long; corolla 6.5–8.0 mm long, with tube campanulate, 2.5–3.0 mm long × *c*.2.0 mm wide, densely hairy at throat; lobes 4.0–5.0 mm long, obtuse; stamens exserted; filaments erect, 2.5–3.0 mm long; anthers 2.5–3.0 mm long; disc shorter than the calyx limb; style (with stigma) 7.0–8.0 mm long. **Fruits** subglobose or broad ellipsoid, 5.0–6.0 mm long × 5.0–7.0 mm wide; pyrenes exceedingly rugose.

***Additional representative specimens*: Queensland.** COOK DISTRICT: Princess Charlotte Bay, Marrett River, 14°25'S, 144°15'E, May 1979, *Elsol & Stanley* 667 (BRI)*[8]; Dixie Station, Sugarloaf, 15°02'S, 143°27'E, Dec 1994, *Garnett* 1555 (BRI); Battle Camp Range, 15°23'S, 144°40'E, Mar 1995, *Garnett* 1578 (BRI); Dixie Station, Lower Emu Creek, 15°04'S, 143°32'E, Apr 1995, *Garnett* 1579 (BRI).

***Distribution and habitat*:** North Queensland; usually in sandy soil on sandridges and drainage flats, in open woodlands. According to collector Garnett, this species occurs at the base of mounds of the termite *Amitermes laurensis*, in low open woodlands dominated by *Eucalyptus papuana* F.Muell. and *E. clarksoniana* K.D.Hill & L.A.S.Johnson (Myrtaceae), and also with *Melaleuca viridiflora* Sol. ex Gaertn. (Myrtaceae). This species is known only from the above specimens. **(Map 14)**

***Diagnostic attributes*:** *Psydrax pallida* is characterised by its long petiolate leaves with broad, prominently nerved and reticulate, usually foveolate blades, and open inflorescences with flowers on slender pedicels.

***Affinities*:** In its broad leaf blades with prominent nerves and reticulate venation, *Psydrax pallida* most resembles *P. reticulata* but differs from that by having the base of the leaf blade acute and attenuate into a much longer petiole rather than rounded or obtuse and shortly attenuate into a comparatively shorter petiole. It also appears to be related to *P. latifolia* in its broad, prominently nerved leaf blades, e.g. in the collections from Dixie Station and Battle Camp Range cited above, and to *P. attenuata* in its inflorescences, flowers and colour of branchlets. It differs from *P. latifolia* in its long petioles, usually foveolate leaf blades with less dense reticulate venation, exceedingly pale brown branchlets and flowers on longer pedicels. It differs from *P. attenuata* in its comparatively long petioles, its broad leaf blades with prominent nerves and reticulate venation, and its very pale brown branchlets. However, *P. pallida* is imperfectly known and more specimens are necessary to be certain that it is constantly distinct from these species.

***Note*:** The Elsol & Stanley collection cited above (*[8]), which is in bud only, has a slightly different aspect due to its leaves and inflorescence. Its inclusion here as *Psydrax pallida* is therefore tentative.

***Etymology*:** The specific epithet *pallida*, Latin for 'pale', refers to the very pale grey or pale brown, almost whitish stems and very pale grey twigs in this species.

15. Psydrax attenuata (Benth.) S.T.Reynolds & R.J.F.Hend., **comb. nov.**; *Canthium attenuatum* Benth., *Fl. Austral.* 3: 421 (1867). **Type:** [Queensland.] North Coast (Carpentaria islands 'a' (Sweers Island) and 'b' (Bentinck Island), Nov 25–28 1802), *R. Brown* [3443] (lecto, here designated: BM; isolecto: BM; K; MEL [MEL1538097]).

Small trees 3–7 m high; bark pale or dark grey, usually rough towards base, smooth distally; branchlets pale brown, reddish brown or grey mottled with white, but reddish brown, pale grey or brownish coloured distally, the older ones with somewhat rough bark, the younger ones smooth and angular or subterete. **Leaves** opposite; stipules ovate, prominently keeled and attenuate into an apical lobe; petioles 0.5–1.7 (–2.2) cm long, subterete; blades elliptic, narrow elliptic or lanceolate, 4.2–11.2 (–13.0) cm long × 1.0–3.0 (–4.2) cm wide, with apex acute, subacute or obtuse, and base acute or subacute, attenuate and decurrent into the petiole (usually to below middle of petiole), coriaceous; both surfaces glabrous, yellowish green or pale green, drying yellowish brown or brown; midrib slender, mostly ridged adaxially, raised abaxially; lateral nerves usually distinct on both surfaces, in 2 or 3 (or 4) pairs, the lower 2 pairs usually decurrent along midrib, opposite or alternate, slender, oblique and looping at margins, or acutely angled to the midrib; reticulate venation loosely arranged, usually prominent; domatia absent or present on all leaf blades or only on one or two of the one branchlet, when present 1–3 on each side of the midrib, usually small and inconspicuous and situated in the axils of the median pairs of nerves. **Inflorescences** 2.4–4.5 cm long × 3.5–5.5 cm wide, exceedingly open, (8–) 13–90-flowered; basal peduncles 0.2–1.0 cm long, with minute bracts distally and terminated by 2 or 3 branched cymes; branches slender, 0.6–1.5 cm long, terminated by 3–11-flowered cymes. **Flowers** 4- or 5-merous; pedicels slender, those of solitary flowers (3.5–) 8.0–10.0 mm long, that of others 1.5–9.0 mm long; calyx 1.0 –2.0 mm long, with tube somewhat turbinate and limb shallowly 4- or 5-denticulate, the lobes broad ovate; corolla 5.5–8.0 mm long; tube obconic, dilated to mouth, 1.5–3.5 mm long × 2.5–3.0 mm wide at mouth, usually sparsely hairy at its throat; lobes narrow ovate or elliptic, 3.0–5.5 mm long × 1.0–1.5 mm wide, acute or subacute, erect or subpatent; stamens erect, exerted; filaments 1.0–3.0 mm long; anthers 2.0–3.0 mm long; style (with stigma) 6.0–10.0 mm long; stigma broad and shallowly 2-lobed at apex. **Fruits** obovoid or ellipsoid, 0.4–0.7 cm long × 0.5–0.8 cm across, 2-lobed or sometimes 1-lobed, verrucose when dry; pyrenes broad ellipsoid, usually exceedingly rugose.

***Distribution and habitat*:** From Dampier Peninsula, Western Australia, to northern and central Queensland, and on offshore islands; in coastal vine thicket remnants or open woodlands, on creek banks, rocky slopes and ridges, on sandy, rocky or clay soils.

***Diagnostic attributes*:** *Psydrax attenuata* is characterised by its narrow elliptic or lanceolate, usually foveolate leaf blades which have domatia present on at least on some leaves of a branchlet, and which are narrowed proximally and decurrent into the petiole and have prominent nerves and reticulate venation, its open laxly branched inflorescences with fragile 4- or 5-merous flowers on long slender pedicels, and by its brownish, reddish brown or greyish coloured branchlets.

***Notes*:** *Psydrax attenuata* was found to be one of the most complex and variable of *Psydrax* species based on the many different-looking specimens filed under this name in various herbaria. However, on closer examination, some of these specimens were found to be identical with others filed as *P. oleifolia* (or *Canthium oleifolium*), while yet others represented undescribed taxa associated with the species concerned.

Bentham (1867) in describing what he took to be a single species Robert Brown in manuscript had called '*Pilidium attenuatum*', in effect cited ten syntypes for the name he gave it with his brief diagnosis. Although his description (especially with respect to measurement of leaves) covered the specimens he cited, three (possibly four) distinct species, two (possibly three) of which are undescribed, are distinguishable in these syntypes in addition to *Canthium attenuatum*. Moreover, one of the syntypes, namely Burdekin River, leg. *F. Mueller* (identified as *P. saligna* in this paper), was cited again by him under *Canthium oleifolium* (Bentham 1867, p.422). Consequently specimens which matched any of the specimens or came from any of the localities cited by Bentham were filed under the name *C. attenuatum* in herbaria, making this species seem extremely variable and very difficult to delimit.

To fix the application of Bentham's name, *Canthium attenuatum* is lectotypified here. Bentham (1867), as indicated above, cited ten syntypes under his brief diagnosis of *C. attenuatum* namely "Brunswick Bay, N.W. coast, *A. Cunningham*; Victoria River and Arnhem's Land, *F. Mueller* (= 2 separate collections); N. coast, *R. Brown**[9]; Sweers Island, *Henne*; Burdekin and Burnett rivers *F. Mueller* (= 2 separate collections); Port Denison, *W. Hill*, *Bowman* (= 2 separate collections); St George's Bridge on the Balonne, *Mitchell*."

Considering that Bentham primarily intended to recognise the species that Brown named '*Pilidium attenuatum*' in manuscript, Brown's collection from the north coast of Australia Brown annotated with this manuscript name is here chosen as lectotype of *Canthium attenuatum*. This lectotype, housed in herbarium BM, agrees with Brown's manuscript description of this species (as "No.29 spec"; microfilm of manuscript held in BRI) and with Bentham's protologue. An illustration prepared contemporaneously with Brown by Ferdinand Bauer from relevant material has been published by Mabberley & Moore (1999).

The isolectotype at K and that at MEL are labelled "North Coast, leg. *Brown*", whereas the isolectotype at BM is labelled "Carpentaria island 'a' and 'b', Nov 25–28 1802, leg. *Brown* 3443", and is annotated '*Pilidium*' by Brown.

The other collections cited by Bentham (now lectoparatypes) are referred to the following species in this paper.

(a) The specimens from Brunswick Bay, Victoria River and Arnhem Land are *Psydrax pendulina*.

(b) The specimen from Sweers Island (K) is referrable to *Psydrax attenuata* as delimited in this revision (see under *P. attenuata* var. *attenuata*).

(c) The specimens from Burdekin River and Port Denison are referrable to *P. saligna*.

(d) The specimen from St George's bridge on the Balonne [River] is referrable to *P. oleifolia*.

(e) The specimen from the Burnett River was not seen in this study but probably belongs in *P. longipes*, which occurs in that area.

Since Brown did not suggest the name *Canthium attenuatum* in his manuscript, Bentham only should be cited as the author of that name in spite of what he said when publishing it.

Affinities: *Psydrax attenuata*, in the sense accepted in this paper, may be distinguished from its close relatives *P. lepida, P. longipes, P. pendulina* and *P. saligna*, and from *P. oleifolia* as follows.

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1. **P. attenuata** from **P. oleifolia**

Leaf blades discolorous, prominently nerved and reticulate veined; domatia usually present; inflorescences open, loosely branched; pedicel of solitary flowers usually 8.0–17.0 mm long; flowers 4- or 5-merous; corolla tube usually densely hairy at its mouth .... **P. attenuata**

Leaf blades concolorous, usually without domatia and conspicuous reticulate venation; nerves obscure or distinct; inflorescences mostly small and compact with flowers congested on branches; pedicel of solitary flowers 3.5–5.0 (–7.0) mm long; flowers 4-merous; corolla tube sparsely hairy at its mouth .... **P. oleifolia**

2. **P. attenuata** from **P. saligna**

Leaf blades 0.6–1.8 cm wide, 4–10 times as long as wide; reticulate veins indistinct; domatia always present on leaf blades; inflorescences branched once only, to 22-flowered; branchlets dark coloured .... **P. saligna**

Leaf blades 1.0–3.0 (–4.2) cm wide, 3 or 4 times as long as wide; reticulate veins prominent; domatia not always present on leaf blades; inflorescences many-branched, to 50-flowered; branchlets reddish brown, brown or grey .... **P. attenuata**

3. **P. attenuata** from **P. longipes**

Leaves with petioles 0.5–1.7 (–2.2) cm long and blades usually 1.4–3.0 cm wide, 3–4 times as long as wide; domatia present on most or only some leaves of a branchlet; pedicel of solitary flowers usually 8.0–11.0 mm long; corolla 5.5–8.0 mm long . . . . **P. attenuata***10
Leaves with petioles 1.2–3.5 cm long and blades usually 2.6–4.0 cm wide, about twice as long as wide; domatia present only on some leaves of a branchlet; pedicel of solitary flowers usually 5.0–7.0 mm long; corolla 7.5–11.0 mm long . . . . **P. longipes**

(For *10 above, see in particular *P. attenuata* forma *megalantha* of this species.)

4. **P. attenuata** and **P. lepida** resemble each other in their leaves, but the latter differs from the former in its slightly shiny leaves which always have domatia, and its 5-merous flowers (see the key to the *Psydrax attenuata* group above).

5. **P. attenuata** and **P. pendulina** may readily be distinguished by the comparatively long, strongly nerved, efoveolate leaves and reddish coloured, 4-angular young branchlets of the latter species (see the key to the *Psydrax attenuata* group above).

***Variability*:** *Psydrax attenuata*, as circumscribed here, varies greatly in its general appearance, leaves (especially in the presence or absence of domatia) and branchlet colour, the presence or absence of galls on branchlets, the length of its petioles and pedicels and the type of cymule terminating each inflorescence branch. Though three varieties are recognised here, they are poorly known so that collection of more specimens with associated field information in the future may well result in a change of status of all or some of these taxa.

Key to varieties of *Psydrax attenuata*

1. Domatia usually present on most leaves of a branchlet, 1–3 on each side of the midrib; petioles usually 0.5–1.0 cm long . . . . **15a. P. attenuata** var. **attenuata**
Domatia absent or if present then only on one or two leaves of a branchlet and usually one on each side of the midrib; petioles usually 0.7–2.2 cm long 2

2. Pedicel of solitary flowers much longer than those of other flowers of the cyme; domatia usually present (at least on one or two leaves a branchlet); insect galls usually present on branchlets and stems . . . **15b. P. attenuata** var. **myrmecophila**
Pedicels of all flowers of the cyme equal or subequal in length; domatia rarely present on the leaves; insect galls usually absent on branchlets and stems . . . . **15c. P. attenuata** var. **tenella**

15a. P. attenuata (Benth.) S.T.Reynolds & R.J.F.Hend. var. attenuata

Leaf blades elliptic, 4.2–6.0 cm long, decurrent into a comparatively short petiole; domatia 1–3 on each side of midrib, usually prominent.

***Additional representative specimens*:** **Northern Territory.** Bessie Springs, 8 km ESE of Cape Crawford (16°40'S, 135°52'E), Oct 1975, *Cardale* s.n. (CANB)*11; Calvert River mouth (16°16'S, 137°46'E), Jun 1987, *Thomson* 1862 (DNA); Vanderlin Island, 7 km SE of Lake Eames (15°43'S, 137°05'E), Aug 1988, *Latz* 11105 (DNA). **Queensland.** BURKE DISTRICT: Sweers Island, SE of resort near the currently used well, 17°07'S, 139°36'E, Nov 2002, *Pedley & Thomas* SWI153 (BRI); Sweers Island, date unknown, *Henne* s.n. (K); Gulf of Carpentaria (probably same as previous), date unknown, *Henne* s.n. (K).

***Distribution and habitat*:** Around theGulf of Carpentaria and on close-by offshore islands; usually in coastal scrubs. (**Map 11**)

***Note*:** *Psydrax attenuata* var. *attenuata* is poorly known and represented in this study by the lectotype of the species name and a few collections as indicated above. It is very similar to *P. attenuata* var. *myrmecophila* except for its leaves with comparatively shorter petioles and shorter blades. Collection of more specimens in the future may indicate that the latter variety is but a form of the former.

Of the specimens cited above, only the Cardale specimen (*[11]) is in flower (apart from the lectotype specimen) but its leaves are too young to be certain of their mature characteristics so its inclusion here is tentative.

15b. P. attenuata var. **myrmecophila** S.T.Reynolds & R.J.F.Hend., **var. nov.** a *P. attenuata* var. *attenuata* petiolis longioribus, foliis interdum foveolatis, ramulis plerumque myrmecophlis differt. **Typus:** Queensland. BURKE DISTRICT: Lawn Hill National Park, 18°34'S, 138°38'E, November 1986, *B. O'Keefe* 2 (holo: BRI).

Bark dark grey or grey, usually rough at base of stem and smooth distally; branchlets terete or angular distally (sometimes dilated at nodes), brown, reddish brown, yellowish brown or grey; stems and branchlets often with prominent insect galls. Leaf blades 4.7–13.0 cm long × 1.0–3.0(–4.2) cm wide, bright green, yellowish green, pale or dull green, drying yellowish brown or brown, dull or with a slight sheen on the adaxial surface; lateral nerves in (2), 3 or 4 pairs, the middle one more obvious and acutely angled to midrib and usually provided with a domatium in each axil (domatia present only on some leaves of a branchlet). Inflorescences 10–90-flowered; main peduncle 0.2–1.0 cm long; branches 0.3–0.7 cm long. Flowers 4- or 5-merous; pedicel of solitary flowers (3.5–) 8.0–11.0 mm long, of others (1.0–) 2.5–6.0 mm long; calyx 1.0–2.0 mm long; corolla 6.0–8.0 mm long, usually sparsely hairy at the throat; lobes narrow ovate, 4.0–5.5 mm long, obtuse. Fruits broad ellipsoid, 4.0–7.0 mm long × 5.5–7.0 mm wide, exceedingly pale brown or off-white and ribbed when dry; pericarp thin; pyrenes exceedingly rugose.

***Diagnostic attributes*:** *Psydrax attenuata* var. *myrmecophilia* is characterised by its long petiolate, narrow elliptic foveolate or efoveolate leaves and galled stems and branchlets. It appears to be scarcely distinct from *P. attenuata* var. *tenella*, with which it shares the same leaf-blade, domatia and long-petiole attributes, but that variety differs by its subumbelliform cymules and usually efoveolate leaves. More collections especially of flowering plants are necessary to be certain that these varieties are constantly different.

***Etymology*:** The varietal epithet *myrmecophila*, from Greek *myrmeco-*, 'pertaining to ants', and *-philus*, 'loving', refers to the insect galls, home to species of ants, found on stems and branchlets of this variety.

***Variability*:** The nature of the leaves, the colour of branchlets and the size of inflorescence and flowers are variable in specimens of this variety available for study and a number of forms are distinguishable within them. Two are considered distinctive enough to be formally recognised here.

Key to forms of *Psydrax attenuata* var. *myrmecophila*

1. Inflorescences (16–) 25–90-flowered; pedicel of solitary flowers 0.8.–1.0 cm long, of others usually 0.5.–0.75 cm long; corolla 6.0–7.5 mm long; branchlets usually reddish brown or brown
 .... **15b(i). Psydrax attenuata** forma **myrmecophila**

 Inflorescences (8–) 12–21-flowered; pedicel of solitary flowers (0.5–) 0.8–1.1 cm long, of others 0.2–0.35 cm long; corolla 6.5–8.0 mm long; branchlets brown, yellowish brown or grey....... **15b(ii). Psydrax attenuata** forma **megalantha**

15b(i). P. attenuata forma **myrmecophila** S.T.Reynolds & R.J.F.Hend., **forma nov.** a *P. attenuata* forma *megalantha* inflorescentiis plerumque floribus 25–90, floris solitarii pedicello bis pedicellos ceteros in longitudine et floribus corolla 6.0–7.5 mm longa differt. **Typus:** As for **P. attenuata** var. **myrmecophila**

Branchlets usually reddish brown and dilated at nodes; leaf blades yellow brown when dry, with prominent nerves and reticulate venation; inflorescences (16–) 25–90-flowered.

***Additional representative specimens*: Northern Territory**. Larrimah to Darwin, Aug 1942, *Huang* s.n. (AD); 18.8 miles (*c*.30.08 km) W of Soudan (20°04'S, 136°30'E), Oct 1957, *Chippendale* 3830 (BRI, DNA, NSW); 10–12 miles (*c*.16–19 km) NW of Cleanskin Yards, Sep 1967, *Nicholls* 719 (DNA)*[12]; Cox River Station, Tanumbirini Creek (16°01'S, 134°47'E), Jul 1977, *Latz* 7311 (DNA); Gregory National Park (15°37'S, 131°08'E), Feb 1986, *Thomson* 1281 (DNA)*[12]; Barkly Stock Route (19°08'S, 136°46'E), Mar 1988, *Brock* 322 (DNA); Dunmarra (16°37'S, 133°19'E), Mar 1991, *Wilson* 107 (DNA). **Queensland**. Burke District: Carpentaria, in 1875, *Gulliver* 39 (MEL); Mt Isa, Oct 1930, *MacCallum* 95 (BRI); Adel's Grove, Jan 1946, *deLastang* 110 (QRS); 107 miles (*c*.172 km) NW of Mt Isa, on Barkly Highway, 19°45'S, 138°05'E, Jul 1974, *Ollerenshaw* PO1276 & *Kratzing* (BRI); 25 km N of Mt Isa, Mt Isa to Camooweal Road (20°33'S, 139°29'E), Jan 1987, *Russell-Smith* 1882 & *Lucas* (DNA); Lawn Hill National Park, Jan 1989, *O'Keefe* [AQ454831] (BRI); 34 km N of Barkly Highway on Thorntonia–Yelvertoft Road, 19°46'S, 138°48'E, Apr 1990, *Latz* 11624 (BRI); Mussellbrook section of Lawn Hill National Park, 42.5 km N of Mussellbrook Mining Camp, 18°21'S, 138°09'E, May 1995, *Thomas* 818 & *Johnson* (BRI); 8.9 km SE of Mussellbrook Mining Camp, 18°38'S, 138°11'E, May 1995, *Thomas* 991 & *Johnson* (BRI).

***Distribution and habitat*:** North-eastern Northern Territory to north-west Queensland, common on the Barkly Tableland; on ridges, slopes and along creeks, on sandy and rocky soil. (**Map 11**)

***Diagnostic attributes*:** *Psydrax attenuata* forma *myrmecophila* is characterised by its usually foveolate, green or greenish yellow, narrow elliptic leaf blades which attenuate proximally into the petiole and which have exceedingly oblique lateral nerves, and its laxly flowered, open inflorescences with long-stalked, usually 5-merous flowers.

This form resembles *P. attenuata* var. *tenella* and *P. attenuata* forma *megalantha* in its long, narrow leaf blades with very oblique nerves and its long petioles, but the former taxon differs by its subumbelliform cymules, whereas the latter one differs by its larger flowers.

***Variability*:** The leaves are quite variable in this form. Specimens from shallow soil on rocky slopes and ridges usually have narrow elliptic or elliptic, pale green or greenish yellow leaf blades with very oblique, fine lateral nerves and obscure domatia, whereas specimens from deeper soil on creek and river banks and lateritic plains have elliptic usually efoveolate leaf blades with often more conspicuous nerves. Plants from lateritic country are reported by collectors to be very green in colour with bright green leaves whereas the leaves of plants from other areas are reported as pale green or yellow green.

***Notes*:** The collections from Cleanskin Yards and Gregory National Park cited above (*[12]) are tentatively included here because in most respects they appear to be of this variety. However, as they are sterile, fertile specimens would be necessary to be certain of their placement.

The use of the epithet '*myrmecophila*' in the name of this form follows Recommendation 26A.3. in the current International Code of Botanical Nomenclature (Greuter *et al*., 2000).

***Uses*:** Plants of *Psydrax attenuata* forma *myrmecophila* are reported by collectors to be readily eaten by stock; sheep especially are apparently very partial to it and graze foliage to as far up as they can reach.

15b(ii). Psydrax attenuata forma **megalantha** S.T.Reynolds & R.J.F.Hend., **forma nov.** aemulans *P. attenuata* forma *myrmecophila* S.T.Reynolds & R.J.F.Hend. a quo inflorescentiis plerumque floribus 12–21 floris solitarii pedicello plerumque plus quam ter pedicellos ceteros in longitudine et floribus corolla 6.5–8.0 mm longa differt. **Typus:** Queensland. North Kennedy District: Fletcher Creek, Hann Highway, 19°4-'S, 146°0-'E, November 1985, *E.M. Jackes* 19 (holo: BRI).

Bark dark or pale grey, usually finely tessellated proximally, smooth distally; branchlets brownish or greyish coloured mottled with white; stems and branchlets often galled;

branchlets, petioles and nerves drying brown or with a yellowish tinge. Leaves with blades narrow elliptic, 8.0–13.0 cm long × 1.4–2.5 (–2.8) cm wide, with apex obtuse, and base acuminate and attenuate into the comparatively long petiole; adaxial surface yellow green; abaxial surface bright green; lateral nerves prominent, in 3 pairs, acutely angled to the midrib, obscure or not apparent abaxially; veins finely reticulate, prominent on young leaves, indistinct on adult ones, not apparent on abaxial surface; domatia present, inconspicuous, one on each side of midrib, usually present only on one or two leaves of the one branchlet. Inflorescences (8–) 12–21-flowered; peduncles and pedicels often drying reddish brown. Flowers 5(rarely 4)-merous; pedicel of solitary flowers (5.5–) 8.0–11.0 mm long, of others 2.0–3.5 mm long; calyx 1.5–2.0 mm long; corolla 6.5–8.0 mm long. Fruits broad ellipsoid, 1- or 2-celled, 4.0–7.0 mm long × 5.0–7.0 mm wide; pericarp thin, shiny when dry; pyrenes rugose.

***Additional representative specimens*: Queensland**. Cook District: on Einasleigh–Lynd Roads near Einasleigh, 18°3-'S, 144°0-'E, Dec 1967, *Sankowsky* 736 & *Sankowsky* (BRI). North Kennedy District: approx. 45 miles (72 km) SE of Mt Garnett, 18°15'S, 145°25'E, Jan 1968, *Morain* 278 (BRI, K); Felspar, 10 km WNW of Charters Towers, 19°50'S, 145°15'E, Feb 1993, *Rolfe* 510 (BRI); Black Mountain, NW of Pentland, 20°23'S, 145°04'E, Jul 1993, *Fensham* 1040 (BRI). South Kennedy District: 3.5 miles (*c*.5.6 km) SE of Yarrowmere Station, 21°30'S, 145°55'E, May 1964, *Adams* 983 (BRI, CANB, K, PERTH); 8 km NNE of Carmichael Homestead, 21°54'S, 146°08'E, Apr 1992, *Thompson* 206 & *Simon* (BRI). Mitchell District: 2.9 km from turn-off to Cherhill, on road to Lake Dunn, 22°41'S, 145°31'E, Sep 1990, *Wilson* 526 & *Rowe* (BRI); about 42 km E of Aramac, Mailmans Gorge, 22°—'S, 146°—'E, Oct 1994, *Smyrell* 85 (BRI). Leichhardt District: 1 mile (*c*.1.6 km) E of Langley Homestead, 80 miles (*c*.128 km) NE of Emerald, 22°40'S, 148°59'E, Nov 1969, *Auldist* 24 (BRI, K); Junee Tableland, N of Dingo, 22°47'S, 149°03'E, Nov 1990, *Bean* 2589 (BRI).

***Distribution and habitat*:** Known only from the above collections from northern and central eastern Queensland; usually on sandy loam in open woodlands. (**Map 11**)

***Diagnostic attributes and affinities*:** *Psydrax attenuata* forma *megalantha* is imperfectly known as specimens of it available for study are mostly poor and variable in morphological attributes. More specimens, especially flowering ones, are needed to be certain of its characteristics and affinities. It is tentatively included under *P. attenuata* because it resembles *P. attenuata* forma *myrmecophila* in its long leaves, long petioles, domatia, lax inflorescences, usually 5-merous flowers and myrmecophilous branchlets. It has, however, a different aspect from that form in its branchlets and leaves, and also differs from that by its yellowish tinged dried branchlets, petioles and nerves, and larger flowers.

***Variability*:** The leaves of this form are quite variable. Specimens with shorter leaves approach some of the collections included here under *P. longipes* and are often difficult to distinguish from that species because they have the same general aspect, colour of dried inflorescences and large 5-merous flowers. However, *P. longipes* generally has leaves with wider blades and longer petioles, larger flowers and usually whitish coloured branchlets which are usually without insect galls. Specimens with small, narrow, indistinctly nerved leaf blades resemble those of *P. saligna* but in that species the leaf blades are usually foveolate and its branchlets are dark coloured.

***Etymology*:** The forma epithet *megalantha*, from Greek *mega*, 'large', and *anthos*, 'flower', refers to the comparatively large flowers found in this form.

15(c). Psydrax attenuata var. **tenella** S.T.Reynolds & R.J.F.Hend., **var. nov.** quoad folios et adspectum *P. attenuatam* var. *myrmecophilam* similem sed cymulis subumbelliformis (florum pedicellis subaequalibus), foliis plerumque efoveolatis et ramulis non myrmecophilis differt. **Typus:** Western Australia. Bobby Creek, 11 km ENE of Beagle Bay, Dampier Peninsula, 16°58'S, 122° 47'E, 23 April 1988, *B.J. Carter* 267 (holo: BRI, iso: PERTH).

Small, multistemmed trees; trunks with bark somewhat dark grey, deeply furrowed proximally, smooth distally; branchlets exceedingly pale grey or dark grey, terete, very rarely with insect galls. Leaves with blades 5.5–11.2 cm long × 1.7–2.5 cm wide, drying greyish green or brown; lateral nerves in 3 or 4 pairs, with reticulate veins fine; domatia absent or rarely present when 1 (rarely 2) on each side of midrib. Inflorescences 22–50-flowered;

cymules subumbelliform. Flowers 4-merous; pedicels slender, 0.5–1.0 cm long, those of solitary flowers more or less of the same length as those of other flowers; calyx 4-toothed; corolla 6.0–7.5 mm long, with tube 2.5–3.5 mm long and sparsely hairy at its mouth, and lobes narrow ovate, 3.0–4.0 mm long. Fruits broad ellipsoid, 6.5–7.0 mm long × 6.0–7.0 mm wide; pericarp thin, pale brown when dry; pyrenes rugose.

***Additional representative specimens*:** **Western Australia.** Emu Creek, Kununurra (15°45'S, 128°45'E), Dec 1982, *Done* 639 (DNA); Broome (17°58'S, 122°14'E), Jun 1984, *Kenneally* 9020 (PERTH); 3.2 km E of Bungle Bungle Outcamp on track to Osmond Valley Palms Yard (17°20'S, 128°22'E), Jul 1984, *Forbes* 2547 (CANB, MEL); ditto, *Scarlett* 84-296 (CANB, PERTH); 14.7 km S of campsite adjacent to Red Rock Creek, 10 km ENE of Bungle Bungle Outcamp, (17°26'S, 128°26'E), Jul 1984, *Kenneally* 9227 (K, PERTH); about 2 km SW of Broome (17°58'S, 122°13'E), Nov 1986, *Wilson* 12561 (PERTH).

***Distribution and habitat*:** Western Australia, from Dampier Peninsula to east Kimberley; usually along creeks on sandy and clay soils. (**Map 11**)

***Diagnostic attributes*:** *Psydrax attenuata* var. *tenella* differs from *P. attenuata* var. *myrmecophila* in its subumbelliform cymules terminating inflorescence branches and usually efoveolate leaves. However, as only two of the collections of it seen for this study are in flower, it is difficult to be certain of all its characteristics.

***Variability*:** The leaves on specimens available for study are variable. Their blades are lanceolate or elliptic, prominently nerved and finely reticulate-veined on the type specimen, but are shorter on those from Bungle Bungle Outcamp (which are probably only young leaves), and longer and narrower on the collection seen from Broome. The leaves of the latter approach those of *P. pendulina* which occurs in that area, but in that species the leaves are usually more elongate, thin coriaceous, and the young branchlets are quadrangular and reddish in colour.

***Etymology*:** The varietal epithet *tenella*, Latin for 'delicate, slender', refers to the delicate, subumbelliform cymules with flowers on long slender pedicels in the inflorescences of this variety.

16. Psydrax lepida S.T.Reynolds & R.J.F.Hend., **sp. nov.** *P. attenuatae* (Benth.) S.T.Reynolds & R.J.F.Hend. valde similis autem foliis foveolatis subnitentibus, inflorescentiis lepidis, pedicellis comparate longis et gracilibus, floribus 5-meris corolla tubo in orificio dense pubescenti differt. **Typus:** Queensland. Cook District: Cooktown, creek off Mc Ivor River, January 1981, *V. Scarth-Johnson* 1151A [AQ347294] (holo: BRI).

Canthium sp. (Cooktown V.Scarth-Johnson AQ314008), P.I. Forster & D.A. Halford (2002, p.174).

Small trees with bark greyish coloured and smooth; branchlets somewhat brown or usually somewhat red coloured and slightly 4-angular distally and dilated at nodes, the older ones with brown, rough, usually tessellated bark. **Leaves** opposite; stipules ovate, acuminate with a folded lobed at apex and keeled; petioles 0.5–0.8 (–1.0) cm long; blades elliptic or lanceolate, 4.2–8.0 (–9.5) cm long × 1.0–2.8 (–4.2) cm wide, attenuate at apex and base, or with apex subacute or obtuse, and base acute and attenuate into petiole, coriaceous, stiff when dry; adaxial surfaces slightly shiny somewhat dull abaxially, with both surfaces minutely resin-dotted; midrib prominent on both surfaces, raised when dry; lateral nerves in 1–3 pairs, prominent, the lower 2 pairs decurrent with midrib, alternate, oblique, erect and ascending, looping distally, (raised on adaxial surface, indistinct on abaxial one in dried specimens); reticulate veins distinct, fine, loosely arranged; domatia present on most leaves of a branchlet, small, with 1–3 on each side of the midrib. **Inflorescences** 2.5–4.5 cm long × 3.5–5.5 cm wide, eceedingly slender, laxly branched, (8–) 16–29-flowered; basal peduncle 1.0–1.5 cm long, terminated by 2 or 3 branched cymes, axis branches 1.3–1.5 cm long; cymes 6–10-flowered. **Flowers** 5-merous; pedicel of solitary flower 0.8–1.7 cm long, that of others (0.15–) 0.3–0.4 cm long; calyx 1.5–2.0 mm long, 5-toothed; corolla 5.5–7.0 mm long, fragile; tube 2.0–3.0 mm long, inflated, dilated to orifice where 2.0–2.5 mm wide, usually with dense long white hairs projecting from the orifice; lobes 3.5–5.0 mm long × *c.*1.5 mm wide, subacute at apex; stamens with filaments 2.5–2.75 mm long, erect; and anthers 2.0–2.5 mm long; style (with stigma) 6.0–9.0 mm long. **Fruits** obovoid or ellipsoid, *c.* 7.0 mm long × 8.0 mm wide; pyrenes broad ovoid, depressed distally, exceedingly deeply rugose and verrucose all over. (**Fig. 6A–6E**).

***Representative specimens*: Queensland.** Cook District: Finch Bay, near Cooktown, 15°25'S, 145°15'E, May 1966, *Smith* 13100 (BRI); on road between Peach Creek and Leo Creek, approximately 30–40 miles (48–64 km) NE of Coen, approx.13°44'S, 143°15'E, Oct 1969, *Webb & Tracey* 9896 (BRI); 10 km NE of Silver Plains Homestead (13°54'S, 143°36'E), Aug 1978, *Paijmans* 2959 (CANB); Quarantine Bay, near Cooktown, Apr 1979, *Scarth-Johnson* s.n. (BRI); 19 km W of Peninsula Development Road, 7 km W of Emu Creek, on the track to New Dixie Station, 15°03'S, 143°27'E, Apr 1980, *Clarkson* 3132 (BRI, K)*[13]; Cooktown, creek off Mc Ivor River, 15°2-'S, 145°1-'E, Jan 1981, *Scarth-Johnson* 1151A (BRI); 1 km S of the Peninsula Development Road on the track to Honey Dam about 4 km WSW of Lakeland Downs Township, 15°52'S, 144°49'E, Jan 1986, *Clarkson* 6300 (BRI); Artemis Station, 15°00'S, 143°30'E, Dec 1994, *Garnett* 1553 (BRI); Flinders Island, 14°11'S, 144°15'E, May 1995, *Le Cussan* 506 (BRI). North Kennedy District: approx. 45 miles (72 km) SE of Mt Garnett, 18°15'S, 145°25'E, Jan 1968, *Morian* 278 (BRI); The Bluff E of Mingela, about 70 km S of Townsville, 19°53'S, 146°44'E, Jan 1990, *Cummings* 10302 (BRI)*[13]; Magnetic Island, date unknown, *Sandercoe* 311 *p.p.* (BRI).

***Distribution and habitat*:** Northern Queensland, from Cape York Peninsula to near Townsville; in remnant coastal vine thickets inland of mangroves, on sand ridges, along cliffs and creek banks, on sandy and rocky sandstone soils. (**Map 10**)

***Diagnostic attributes*:** *Psydrax lepida* is characterised by its shiny foveolate leaves, usually delicate inflorescences, 5-merous flowers usually with dense hairs projecting from the orifice of the corolla tube and red- brown or brown branchlets with tessellated bark.

***Affinities*:** *Psydrax lepida* is closely related to *P. attenuata* and may be found with further study to be conspecific with that species. It resembles *P. attenuata* var. *attenuata* in its leaves with oblique nerves and short petioles, but in that taxon domatia are usually present only on some leaves of a branchlet, the leaf blade surfaces are dull, and its flowers are 4- or 5-merous with only sparse hairs at the orifice of the corolla tube (see the key to the *Psydrax attenuata* group above).

***Notes*:** The majority of the specimens seen typically have narrow elliptic or lanceolate leaf blades with domatia on all leaves. A few specimens however have narrower leaf blades (for example, see specimens indicated by *[13] in the list above) which approach those of *P. saligna* but that species differs from *P. lepida* in its usually dull leaf-blade surfaces, small, few-flowered inflorescences and dark coloured branchlets.

The following collections from northern Queensland, which have been identified as *P. attenuata* or *P. odorata* in the past, though mostly incomplete are tentatively included here because in their branchlet and leaf characters they appear to be of this species. They differ, however, from the other collections of *P. lepida* by their wider, obscurely nerved leaf blades with usually a solitary obscure domatium, shorter petioles and few-flowered inflorescences.

Queensland. Cook District: 9 miles (*c.*14.4 km) S of Laura on main Mareeba–Coen Road, approx. 15°41'S, 144°34'E, Oct 1969, *Webb & Tracey* 9925 (BRI); Split Rock to Gugu Yelandji, S of Lake, Lakefield Downs–Laura road, 15°4-'S, 144°2-'E, May 1975, *Byrnes* 3374 (BRI); 31 km from the Peninsula Development Road on the Fairview to Fairlight Road, 15°36'S, 144°02'E, Nov 1983, *Clarkson* 5038 (BRI, K, QRS).

***Etymology*:** The specific epithet *lepida*, Latin for 'neat, fine or elegant', refers to the graceful inflorescences and dainty flowers found in this species.

17. Psydrax saligna S.T.Reynolds & R.J.F.Hend., **sp. nov.** ad *P. attenuatae* (Benth.) S.T.Reynolds & R.J.F.Hend. affinis sed foliis comparate angustis vel angustissimis, nervis lateralis obscuris tenuibus ornata, inflorescentiis brevioribus paucifloris differt. **Typus.** Queensland. South Kennedy District: off Range Road, approximately 4 km from Lake Elphinstone Turnoff, 21°32'S, 148°16'E, 14 November 1987, *I.G. Champion* 308 (holo: BRI).

[*Canthium attenuatum* auct. non Benth.: G. Bentham, *Fl. Austral.* 3: 421 (1867) quoad specimini Burdekin River, [leg.] *F. Mueller*] et Port Denison, [leg.] *W. Hill.*

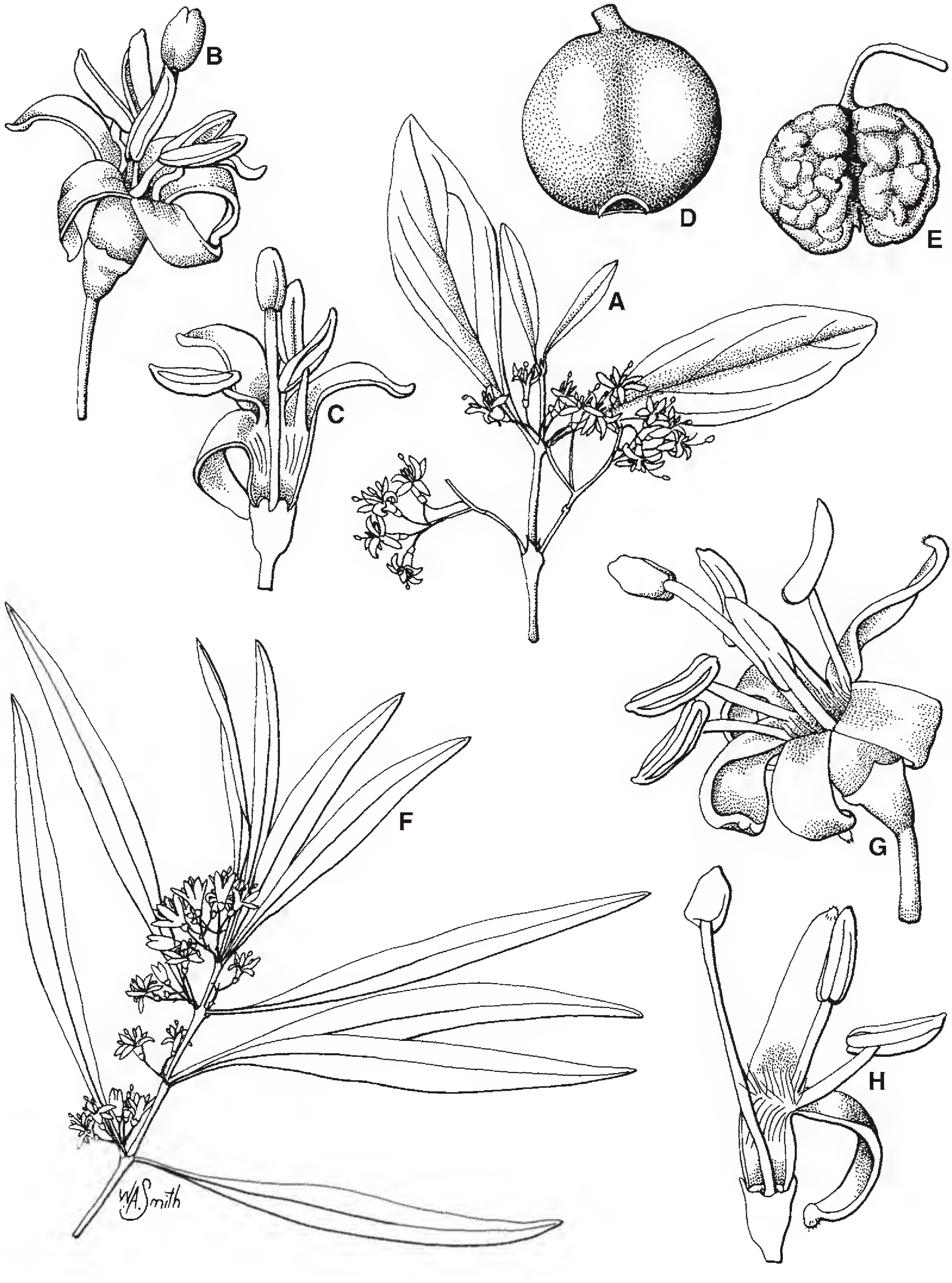

Fig. 6. ***Psydrax lepida***. A. flowering branch × 1. B. flower × 4. C. LS of flower × 4. D. fruit × 4. E. pyrenes × 4. A–C, *Scarth-Johnson* 1151A (BRI); D, *Volck* 4418 (BRI); E, *Smith* 13100 (BRI). ***Psydrax saligna***. F. flowering branch × 0.6. G. flower × 4. H. LS of flower × 4. F–H, *Champion* 308 (BRI).

[*Canthium oleifolium* auct. non Hook.f.: G. Bentham, *Fl. Austral.* 3: 422 (1867) quoad specimini Burdekin River, [leg.] *F. Mueller*].

Small trees 2–6 m high; trunk with bark dark brown or dark grey, smooth or rough; branchlets dark grey or dark reddish brown, with finely tessellated bark, the young ones reddish brown especially distally. **Leaves** opposite; stipules triangular, keeled and attenuated into an apical acuminate lobe, to 5.5 mm long; petioles (0.2–) 0.5–1.4 cm long, subterete; blades narrow elliptic or lanceolate, sometimes somewhat linear, (6.0–) 7.5–11.5 (–14.5) cm long × 0.6–1.5 (–2.0) cm wide, with apex acuminate or obtuse and base narrowed and decurrent into petiole, coriaceous, drying dull and opaque; both adaxial and abaxial surfaces glabrous; lateral nerves in 1 or 2 (or 3) pairs, the lower pair usually acutely angled to the midrib, slender, usually indistinct on adaxial surface, not apparent on abaxial surface; reticulate veins obscure; domatia present, small, 1–3 on each side of midrib. **Inflorescences** 1.2–3.0 cm long × 1.2–3.5 cm across, 5–15 (–22)-flowered; basal peduncle 1.0–8.0 mm long, usually with minute bracts medially and terminated by 2 branched few-flowered cymes; axis branches 5.0–10.0 mm long. **Flowers** 5(rarely 4)-merous; pedicels very slender, that of solitary flowers (5.0–) 10.0–18.0 mm long, of others 3.0–5.5 mm long; calyx about 1.5 mm long, with tube turbinate and limb 4- or 5-toothed; corollas 6.0–8.0 mm long; tube campanulate, occasionally slightly inflated and obscurely striped, 2.0–3.5 mm long × 1.5–2.0 mm wide, densely hairy at the orifice; lobes elliptic or ± lanceolate, 3.0–5.0 mm long × 1.5–2.0 mm wide, obtuse, erect or slightly recurved distally; stamens with filaments 2.0–3.0 mm long and anthers about 2.5 mm long, erect or slightly patent; style (with stigma) 6.0–7.0 mm long. **Fruits** broad ellipsoid or obovoid, 4.0–5.0 mm long × 4.0–6.0 mm wide, black and shiny when ripe; pyrenes rugose. (**Fig. 6F–6H**)

***Distribution and habitat*:** Arnhem Land, Northern Territory, and northern and central Queensland; usually in sandy soil among sandstone rocks and granite boulders, crests of sandy ridges, sandstone escarpments, on steep slopes and granitic outcrops, in deciduous vine thickets.

***Diagnostic attributes*:** *Psydrax saligna* is readily distinguishable by its comparatively narrow, finely-nerved, foveolate leaves, its comparatively small, 5–15 (–22)-flowered inflorescences which have a short peduncle and axis branched only once, its 5-merous flowers on long slender pedicels, and its dark grey or dark reddish brown branchlets.

***Affinities*:** *Psydrax saligna* is closely related to *P. attenuata* and *P. oleifolia*. In the past, some of the specimens cited below have been included in those species but *P. saligna* may be distinguished from them as follows.

P. saligna and *P. attenuata* both have foveolate leaves and usually 5-merous flowers on comparatively long slender pedicels but *P. attenuata* differs from the former in its leaves with broader, prominently nerved and reticulate-veined blades and longer petioles, and its larger inflorescences with a greater number of flowers (see the key to the *Psydrax attenuata* group above).

P. saligna and *P. oleifolia* resemble each other in their leaves (especially in the typical form of *P. oleifolia*) and their comparatively small inflorescences, but *P. oleifolia* differs from the former by its usually efoveolate leaves, its many-flowered (to 39-flowered) compact inflorescences, its comparatively short pedicels (those of solitary flowers being 3.5–5.0 (–7.0) mm long) and its 4-merous flowers.

***Etymology*:** The specific epithet *saligna*, Latin for 'willow-like', refers to the leaves of this species which resemble those of a *Salix* species (Salicaceae).

***Variability*:** The leaves and inflorescences of *Psydrax saligna* are quite variable. Based on these attributes, two forms are recognised here.

Key to forms of *Psydrax saligna*

1. Pedicel of solitary flowers, filiform, 1.0–1.8 cm long; leaves with petioles 0.8–1.4 cm long and blades 6.0–10.0 cm long × 0.6–1.6 (–2.0) cm wide . . . . **17(b). P. saligna** forma **filiformis**

   Pedicel of solitary flowers comparatively stout, 0.5–1.0 cm long; leaves with petioles 0.2–0.7 cm long and blades 7.5–12.5 (–14.5) cm long × 0.9–1.5 (–1.8) cm wide . . . . **17(a). P. saligna** forma **saligna**

17(a). **Psydrax saligna** S.T.Reynolds & R.J.F.Hend. forma **saligna**

Canthium sp. (Charters Towers T.Stuart TWR116), S.T. Reynolds (1997, p.180), P.I. Forster & D.A. Halford (2002, p.174).

Small trees with usually smooth grey bark on the trunk. Leaves with blades narrow elliptic to almost linear, the lateral nerves and reticulate venation exceedingly fine, sometimes obscure, and domatia 1 or 2 on each side of the midrib. Inflorescences 7–15 (–22)-flowered; pedicel of solitary flowers 5.0–10.0 mm long, that of others 3.0–5.5 mm long; corolla 7.0–8.0 mm long with tube campanulate, not striped. (**Fig. 6B**)

***Additional representative specimens*:** **Queensland.** COOK DISTRICT: Giant Horse Gallery, 15°40'S, 144°30'E, Mar 1975, *Hyland* 8102 (BRI, QRS); Mt Mulligan, about 40 km NW of Dimbulah, 16°51'S, 144°50'E, Apr 1985, *Clarkson* 5899 (BRI). BURKE DISTRICT: Georgetown (18°48'S, 143°48'E), Nov 1942, *Blake* 14722 (DNA); Pairie Gorge, 45 km NNE of Hughenden, 20°30'S, 144°30'E, Jun 1986, *Murray* 64 & *Morgan* (BRI)*[14]; Warang Holding, White Mountains, about 37 km NNW of Torrens Creek Township, 20°29'S, 144°44'E, Jul 1988, *Fell* 1310 & *Swain* (BRI)*[14]; Westmoreland Valley behind Little Amphitheatre, 17°24'S, 138°16'E, May 1997, *Forster* PIF21138 & *Booth* (BRI). NORTH KENNEDY DISTRICT: Burdekin River, Oct 1856, *Mueller* s.n. (BM, K, MEL [MEL1537684])*[15]; Port Denison, in 1874, *Fitzalan* [MEL1537674] (MEL); Ewan, Nov 1930, *Miller* s.n. (BRI); 14 km N of Bowen, on Townsville Road, 19°27'S, 147°57'E, Nov 1971, *Sharpe* 57 (BRI); between Burdekin Dam and Ravenswood, 19°5-'S, 145°2-'E, Dec 1988, *Perry* 2 (BRI); Lucky Downs, Greenvale Area, 18°59'S, 144°58'E, Apr 1991, *Batianoff* 9104042 & *Franks* (BRI)*[14]; Round Mountain, 3 km W of Ross River Dam, Townsville, 19°28'S, 146°42'E, Jun 1991, *Bean* 3298 (BRI); Gloucester Island, southern end, 20°02'S, 148°27'E, Sep 1992, *Batianoff* 9209542 (BRI); Sally's Mesa, 34 km from Greenvale towards Charters Towers, 19°05'S, 145°14'E, Feb 1994, *Bean* 7461 & *Forster* (BRI)*[14]; Yahoo Waterhole, 500 m N of Warrang homestead, White Mountain National Park, 20°26'S, 144°49'E, Jan 1995, *Anchen* 176 (BRI); NW of Townsville, 19°15'S, 146°36'E, Sep 1997, *Fensham* 3327 (BRI). SOUTH KENNEDY DISTRICT: Moonoomoo Station, about 4 km N of homestead, 21°46'S, 146°05'E, Oct 1983, *Henderson* H2783, *Guymer* & *Dilleward* (BRI)*[14]. LEICHHARDT DISTRICT: 7 km from Nebo on Nebo–Clermont Road, 22°15'S, 148°15'E, May 1962, *Johnson* 2375 (BRI); Taunton National Park, 23°30'S, 149°12'E, Dec 1996, *Stansk* T914 (BRI)*[14]. PORT CURTIS DISTRICT: The Springs Grazing Trail, Livingstone Shire, 22°51'S, 150°17'E, Nov 1983, *Anderson* 3602 (BRI); Table Mt, Rockhampton, *O'Shanesy* 41 (MEL).

***Distribution and habitat*:** Northern and central Queensland; mostly on sandstone on escarpments, steep slopes and rocky outcrops, on sandy soil amongst boulders or in sandy rocky soil, in open forests. (**Map 12**)

Variability: The leaves of *Psydrax saligna* forma *saligna* are very variable. Specimens with leaf blades usually narrow elliptic, finely nerved and reticulately veined, and with one or two domatia on each side of the midrib are typical of it. However, specimens with shorter or longer or smaller leaves are also present. Those with shorter leaves, especially ones from central Queensland, are not unlike some of the collections included in typical *P. oleifolia* and consequently have been identified as that species in the past. Specimens with usually smaller, narrow elliptic leaf blades, which have a much duller adaxial surface and fainter nerves, for example, the collections from Mt Mulligan and Giant Horse Gallery above, and specimens with leaf blades 10.5–14.5 cm long and 0.6–0.8 cm wide that are acute or acuminate at the apex and base and occasionally have slightly recurved margins and stipules with a prominent long, folded lobe at the apex (indicated by *[14] in list above) probably represent distinct subforms of this form. However, since these specimens are mostly sterile or have young flower buds only, this cannot be ascertained at the present time.

***Notes*:** Ferdinand Mueller's collection from Burdekin River in October 1856, marked *[15] in the above list, was cited by Bentham (1867) under both *Canthium oleifolia* and *Canthium attenuatum* Benth. (and hence is one of the syntypes of the latter name). Of the three sheets of this Mueller collection seen in this study, two of them (those at BM and MEL) are referrable to *Psydrax saligna*, whereas the sheet at K represents a mixed collection of *P. saligna* (the part with long, narrow, foveolate leaves) and *P. oleifolia* (the part with broader, efoveolate leaves).

17(b). Psydrax saligna forma **filiformis** S.T.Reynolds & R.J.F.Hend., **forma nov.** a *P. saligna* forma *saligna* florum pedicellis filiformis duplo saltem longioribus differt. **Typus**: Northern Territory. Echo Gorge, Wollogorang Station, 17°11'S, 137°43'E, November 1984, *B. Thomson* 795 (holo: BRI; iso: DNA, PERTH).

Small trees with smooth or rough bark on the trunk. Leaves with blades narrow elliptic, obscurely nerved and with domatia 1–3 on each side of the midrib. Inflorescences (5–) 7–9-flowered; flowers with pedicels filiform, that of solitary flowers (6.0–) 14.0–18.0 mm long, of others 2.0–4.0 mm long; corolla 6.0–7.0 mm long with tube broad campanulate, inflated, obscurely striped.

***Additional representative specimens*: Northern Territory.** Jabiru, Bukbukluk Lookout jumpup on Kakadu Highway, 13°35'S, 132°15'E, Nov 1991, *Brennan* 1614 (BRI)*[16]; Jabiru, Ranger U Mine lease, 12°55'S, 132°55'E, Nov 1994, *Brennan* 2953 (BRI)*[16]; Mt Gilruth area (12°58'S, 133°10'E), Jun 1978, *Dunlop* 4900 (DNA); Centre Island, Sir Edward Pellew Group (15°41'S, 136°46'E), Feb 1976, *Craven* 3787 (CANB); Caranbirini Waterhole, 33 km SW of Borroloola (16°16'S, 136°05'E), Nov. 1975, *Cardale* s.n. (CANB); Wollogorang Station, Echo Gorge, 17°11'S, 137°43'E, Nov 1984, *Halford* 841161 (BRI).

***Distribution and habitat*:** Known only from the above collections; usually on sandstone. (**Map 12**)

***Affinities*:** *P. saligna* forma *filiformis* differs from the typical form in its leaves with longer petioles, which are (0.4–) 0.8–1.4 cm long, its smaller, 5–9 (–15)-flowered inflorescences, and its flowers with a comparatively long filiform pedicel and usually broader corolla tube which is sometimes slightly inflated and obscurely striped.

***Notes*:** Collections from near Jabiru, marked *[16] in the above list, are only tentatively included here because they differ from the others in having very pale coloured smooth bark on the stems, wider leaf blades, which are 1.6–2.0 cm wide, and shorter pedicels, those of solitary flowers being (5.0–) 7.0–9.0 mm long, of others 2.0–3.0 mm long. However, in their aspect, leaves with short petioles which are 0.4–0.6 cm long, small inflorescences with 12–15 flowers on a very short basal peduncle 3.0–5.0 mm long, they belong with *P. salicina* forma *filiformis*.

***Etymology*:** The forma epithet *filiformis*, Latin for 'thread-like', refers to the comparatively long, very slender pedicels of the flowers of this form.

18. Psydrax pendulina S.T.Reynolds & R.J.F.Hend. **sp. nov.** aemulans *P. attenuatam* (Benth.) S.T.Reynolds & R.J.F.Hend. a qua foliis longioribus, lamina subfalcata, nervis lateralibus divergentibus (a costa ad angulum 40°–50°), efoveolata, ramulis 4-angulis, floribus 4-meris differt. **Typus:** Western Australia. Brunswick Bay, 3rd Voyage of the Mermaid, October 1820, *A. Cunningham* 178 (holo: BM; iso: K).

[*Canthium attenuatum* Benth., *Fl. Austral.* 3: 421 (1867) quoad specimenibus Brunswick Bay, [leg.] *A. Cunningham*; Victoria River and Arnhem Land, [leg.] *F. Mueller*; et Victoria River, [leg.] *F. Mueller*].

[*Canthium* sp. A, B.L. Koch in J.R. Wheeler, ed., *Fl. Kimberley Region* 906, 927, Fig. 285, A_1 & A_2 (1992), pro parte.

Shrubs or small trees 2–8 m high, usually with slender, drooping stems and leaves; bark dark grey, rough; young branchlets quadrangular distally, usually drying dark reddish brown and often covered with white thin flaky bark, the older ones usually blackish coloured and verrucose. **Leaves** opposite; stipules towards apex of branchlets subulate with a fine apical point, those proximally on branchlets smaller and ovate; petioles 1.0–1.7 (–2.0) cm long, flexuose, erect or subpatent, usually drying pale yellow or whitish (as pale as midrib); blades narrow elliptic though mostly wider below middle, usually subfalcate, (8.5–) 11.5–17.0 (–18.5) cm long × 1.5–2.2 (–2.7) cm wide, with apex acuminate, subacute or rarely obtuse, base cuneate and attenuate into petiole, and both surfaces glabrous, usually thin coriaceous, drying brownish coloured with a pale yellow midrib and nerves; midrib ridged above; lateral nerves conspicuous, in 2 or 3 (–5) pairs, divergent, angled 40°–50° to the midrib, erect and ascending to near apex of leaf blade, looping at margins; reticulate venation very open, obscure; domatia absent. **Inflorescences** in axil of new leaves or above scar of fallen leaves, 2.4–3.5 cm long × 2.4–4.7 cm across, 12–23-flowered, glabrous; basal peduncle (2.0–) 4.0–8.0(–14.0) mm long, with 2 or 3 branched cymes and minute bracts at its distal end; axis branches 7.0–16.0 mm long; ultimate cymules 6–10-flowered. **Flowers** 4-merous; pedicels of solitary flowers (5.0–) 8.0–11.0 mm long, that of others 3.0–6.0 mm long, or occasionally the pedicels of all the flowers more or less equal when cymules are subumbelliform; calyx 2.0–3.0 mm long, with limb 4-toothed, the lobes broad ovate; corolla 6.5–7.5 mm long, with tube 2.5–3.0 mm long, dilated to the orifice, 1.5–2.0 mm wide at base, 2.0–4.0 mm wide at orifice, usually with dense hairs projecting from orifice; lobes ovate-oblong, 4.0–5.0 mm long × 1.5–2.0 mm wide, obtuse, erect to spreading; disc shorter than calyx limb, glabrous or subglabrous; stamens with filaments 1.0–2.0 mm long and anthers 2.0–3.0 mm long, erect or slightly recurved; style (with stigma) 7.0–10.0 mm long. **Fruits** obovoid or transversely ellipsoid, obscurely 2-lobed, 6.0–10.0 mm long × 7.0–10.0 mm across; pericarp drying soft and very thin; pyrenes hard, usually slightly rugose.

***Additional representative specimens*:** **Western Australia**. Drysdale River Mission, Kimberley, Aug 1921, *Gardner* 1049 (PERTH); Napier Broome Bay (14°02'S, 126°36'E), Aug 1921, *Gardner* 1549 (NSW); Bushfire Hill, Prince Regent River Reserve (15°28'S, 125°39'E), Aug 1974, *George* 12303 (PERTH); Phython Cliffs, Prince Regent River Reserve, W Kimberley (15°20'S, 124°56'E), Aug 1974, *Kenneally* 2184/B (CANB, PERTH); Ashton Range, Drysdale River National Park (15°16'S, 126°43'E), Aug 1975, *George* 13302 (PERTH); Hidden Valley, 3.2 km E of Kununurra (15°43'S, 128°48'E), Jul 1976, *Beauglehole* 54207 (PERTH); S of Ernest River (15°25'S, 127°27'E), Mar 1978, *Hartley* 14688 (PERTH); Dampier Peninsula, Djulanan, western-most inlet of Curlew Bay (16°24'S, 123°1-'E), Aug 1986, *Smith* 867 (PERTH); Dampier Peninsula, 8 km NW of One Arm Point (16°25'S, 123°01'E), Jan 1988, *Carter* 190 (PERTH); Dampier Peninsula, S of Hunter Creek, 7 km ESE of Cape Leveque (16°25'S, 122°59'E), Feb 1993, *Carter* 616 (PERTH); Koolan Island (16°07'S, 123°43'E), Feb 1993, *Keighery & Gibson* 16 (PERTH). **Northern Territory**. Victoria River (15°13'S, 129°48'E), Oct 1855, *Mueller* s.n. (K, MEL [MEL1537680 & MEL1537688]); Eva Valley Station, 14°15'S, 132°19'E, Oct 1973, *Dunlop* 3097 (BRI, DNA, K); 1 km N of Pine Creek–El Sharana Rd on Jim Jim road, 13°32'S, 132°19'E, Oct 1978, *Rankin* 1487 (BRI, DNA); above Moline Rock Pool (13°34'S, 132°16'E), Nov 1978, *Rankin* 1638 (DNA); El Sharana Road, E Pine Creek, 13°33'S, 132°17'E, Dec 1979, *Dunlop* 5215 (BRI, DNA, K, NSW); Katherine Gorge National Park (14°19'S, 132°27'E), Oct 1981, *Silvertsen* 624 (DNA); ditto, Apr 1987, *Purdie* 3389 (BRI, CANB); Kakadu National Park, near Kurundie Creek (13°34'S, 132°29'E), Apr 1990, *Cowie* 1166 & *Leach* (DNA); Nitmiluk, 14°19'S, 132°25'E, Dec 1990, *Evans* 3494 (BRI, K).

***Distribution and habitat*:** Northern Australia, from Dampier Peninsula, Western Australia, to Arnhem Land, Northern Territory; amongst sandstone rocks, on sandstone plateau, base of sandstone outcrops and hills, on sandy soil, in open forests. (**Map 13**)

***Diagnostic attributes*:** *Psydrax pendulina* is readily distinguishable by its 4-angular, reddish brown young branchlets, comparatively long, narrow elliptic, efoveolate leaf blades with conspicuous, suberect-divergent nerves (nerves acutely angled to midrib) and 4-merous flowers on comparatively long slender pedicels.

***Affinities*:** *Psydrax pendulina* is closely related to *P. attenuata* and specimens of the former have been included in that species in the past by Bentham (1867), namely the syntypes of *P. attenuata* from Victoria River and Arnhem Land collected by *Mueller*, and from Brunswick Bay collected by *Cunningham*. *P. attenuata*, however, differs from the former by its terete or slightly angular, brown, reddish brown or greyish coloured juvenile branchlets, and its comparatively smaller, thicker, usually foveolate leaf blades which are 4.7–11.0 (–13.0) cm long × 1.5–3.0 cm wide (see the key to the *Psydrax attenuata* group above).

***Variability*:** The majority of relevant specimens seen for this study are what are considered typical of this species. That is, they have thin, coriaceous, narrow elliptic, subfalcate leaf blades and usually expanded spreading inflorescences. However, one or two collections have either typical narrow long thin leaves but short inflorescences while others have thick or shorter leaf blades with expanded spreading inflorescences.

Note: The following sterile collection from low open eucalypt woodland, on red sandy soil, is tentatively included here. It differs from the collections cited above by having broad elliptic leaf blades which are 12.5–13.5 cm long × 3.5–5.0 cm wide, but in its leaf texture, nervature and branchlet characters, it is of *P. pendulina*. This collection probably represents an aberrant form of this species because, according to the label, the plants sucker in groups and the specimens may have been taken from one of these suckers with, perhaps, juvenile foliage.

Western Australia. approximately 1 km N of Derby airport, 17°19'S, 123°39'E, *Tracey* 13977 (BRI, QRS).

Etymology: The specific epithet *pendulina*, Latin for 'hanging down', refers to the usually more or less pendulous branchlets and leaves of this species.

19. Psydrax oleifolia (Hook.f.) S.T.Reynolds & R.J.F.Hend. **comb. nov.**; *Canthium oleifolium* Hook.f. in Mitchell, *Trop. Australia* 397 (1848). **Type**: New South Wales. Plains of the Gwydir (between the Gwydir and Barwon Rivers), December 1846, *T.L. Mitchell* 491 (holo: K; iso: K, NSW).

[*Canthium attenuatum* Benth., *Fl. Austral.* 3: 421 (1867) pro parte quoad specimini St. George's Bridge on the Balonne, [leg.] *Mitchell*].

Erect shrubs or small trees 4–7 m high, usually with straight, erect trunk and stiff, spreading, divaricate branches borne more or less at right angles to the main trunk, hispid and often provided with thorns in the juvenile or regrowth state; bark grey, smooth, or rough proximally and smooth distally; branchlets terete, usually resinous distally, glabrous, smooth or usually spinulose in the juvenile or regrowth state, pale brown or grey, with brownish or greyish coloured bark mottled with white distally. **Leaves** opposite or occasionally clustered on brachyblasts on lower part of branchlets but opposite distally, more or less erect; stipules comparatively small, ovate with a long, subulate lobe at apex, keeled, viscid in young growth; petioles 0.6–1.2 (rarely to 1.7) cm long, flexuose; blades elliptic, narrow elliptic, elliptic-ovate, elliptic-oblong or subobovate, (3.5–) 4.5–6.5 (–8.5) cm long × (0.7–) 1.7–2.4 (–3.3) cm wide, with apex obtuse, ± rounded, subtruncate or retuse and slightly recurved, base subacute, acute or subobtuse and abruptly narrowed and decurrent into petiole, and both surfaces dull, glabrous, smooth or hispid in juvenile or regrowth plants, usually concolorous, pale green and slightly glaucous, or yellowish green, thick coriaceous, drying thick and rigid, pale yellowish green to pale brown; midrib raised below, slightly flattened above; lateral nerves either obscure and subpatent, then in 2–4 (or 5) pairs, or distinct suboblique or oblique and sometimes looping near margins, then in 2 or 3 pairs with 2 pairs usually more obvious; nerves not visible on abaxial surface; reticulate venation not apparent; domatia absent or very rarely present when usually solitary and inconspicuous. **Inflorescences** usually exceedingly small, 1.0–2.6 cm long × 1.5–4.0 cm across, densely flowered with 23–39 flowers, with basal peduncle usually between 2.5–4.0 mm long, the flowers usually congested on the short branches which are 3.0–7.0 mm long and slender, or the inflorescences occasionally loosely flowered with basal peduncles to 10 mm long; peduncles, pedicels and calyces glabrous, usually drying reddish brown or brown. **Flowers** 4(rarely 5)-merous; pedicel of solitary flowers 3.5–5.0 (–7.0) mm long, that of others 0.5–2.5 (–4.0) mm long; calyx 1.0–2.0 mm long, with tube campanulate and limb 4(or 5)-lobed, the lobes ovate, minute; corolla 4.0–6.5(rarely 9.0) mm long; tube broad cylindrical or broad turbinate, 1.5–2.0 mm long, 1.5–2.0 mm wide at orifice, sparsely hairy at throat; lobes subelliptic or lanceolate, 3.0–5.0 (–6.5) mm long × 1.0–1.75 mm across, obtuse, erect or spreading; disc shorter than calyx limb, glabrous; stamens with filaments 1.5–2.5 mm long, erect, and anthers 2.0–2.5 mm long, erect or rarely patent; style (with stigma) 7.0–8.0 mm long, exserted; stigmatic knob oblongoid. **Fruits** obovoid or broad ellipsoid, 4.5–6.0 (–7.0) mm long × 4.5–7.0 mm across; pyrenes broad ovoid, depressed distally or slightly ellipoid, usually rugose distally and laterally. **(Fig. 7A–7F)**

Additional representative specimens: **Queensland**. MITCHELL DISTRICT: Noondoo, 28°35'S, 148°25'E, Dec 1934, *Everist* 751 (BRI, K); Blackall, 24°25'S, 145°45'E, Sep 1937, *Brass & White* 5 (BRI); Warren Point Station, 26°32'S, 148°01'E, May 1968, *Martensz* s.n. (BRI)*[17]. LEICHHARDT DISTRICT: Blackwater, E of Emerald, 23°35'S,148°55'E, Mar

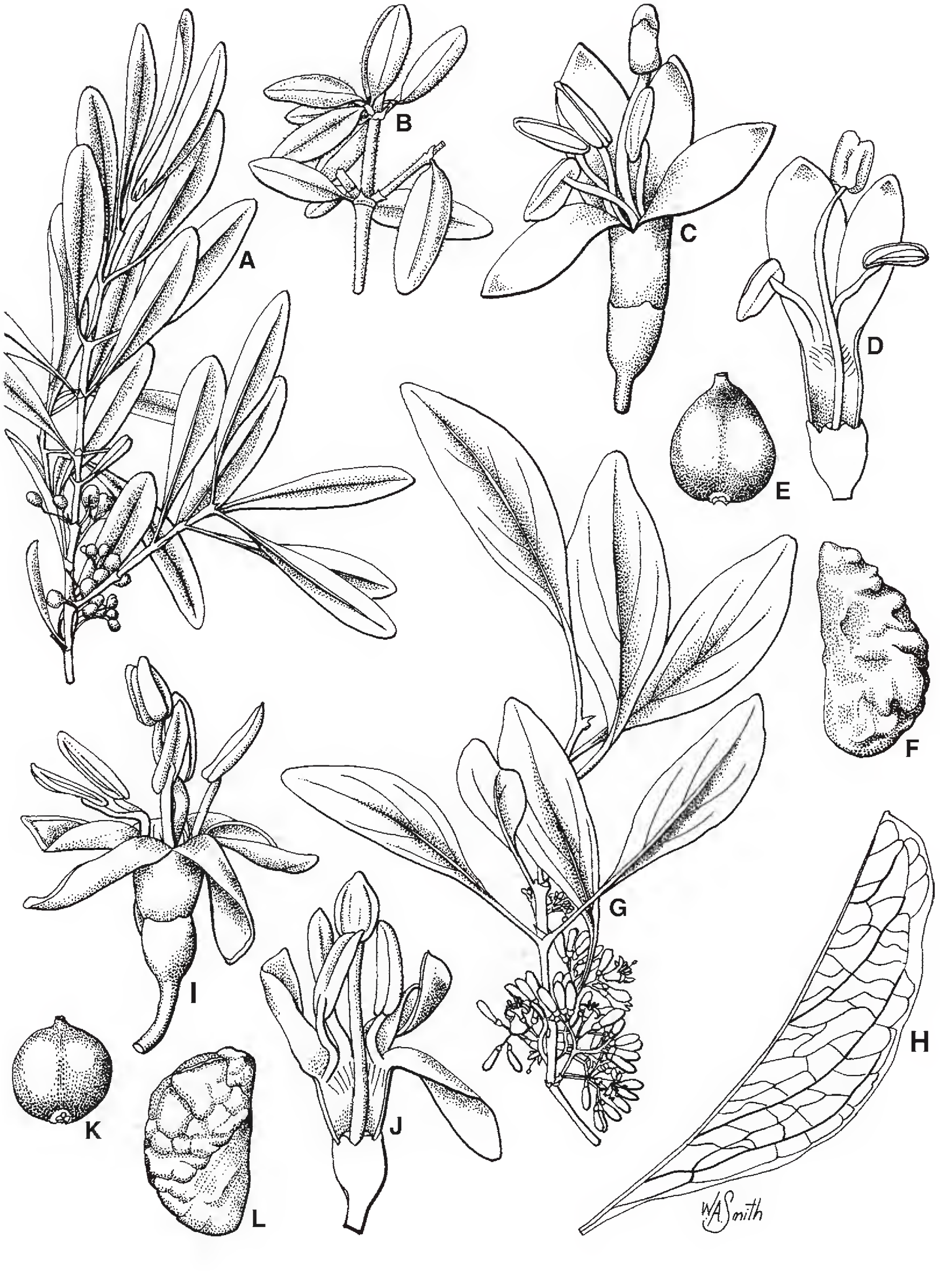

Fig. 7. ***Psydrax oleifolia***. A. fruiting branch (of typical form) × 0.6. B. branchlet (of juvenile growth form) × 1. C. flower × 6. D. LS. of flower × 6. E. fruit × 3. F. pyrene × 6. A,C–F, *Auldist* 10 (BRI); B. *Everist & Smith* 6 (BRI). ***Psydrax longipes***. G. flowering branch × 1. H. portion of leaf showing venation × 1. I. flower × 4. J. LS of flower × 4. K. fruit × 2. L. pyrene × 4. G&H, *Forster* PIF2765 (BRI); I&J, *Forster* PIF6142 (BRI); K&L, *Sankowsky* 460 (BRI).

1920, *Francis* s.n. (BRI)*^{17}; 4 miles (*c*.6.4 km) S of Brigalow Research Station, 24°55'S, 149°47'E, Jun 1969, *Auldist* 10 (BRI, K); Banana Shire, about 1 km S of Brigalow Research Station, 24°50'S, 149°48'E, Nov 1984, *Anderson* 3886 (BRI); Springsure, 24°00'S, 148°00'E, Nov 1987, *O'Keeffe* 884 (BRI); Autumnvale, Bingle Shire, 25°51'S, 148°41'E, Dec 1991, *Schefe* 1157 (BRI); 4 km N of Springsure, 24°04'S,148°05'E, Mar 1995, *Fensham* 2650 (BRI); 3 km NE of Taroom, 25°37'S, 149° 49'E, Nov 1996, *Halford* Q3065 & *Dowling* (BRI). Warrego District: Cunnamulla, 28°04'S, 145°41'E, Jan 1937, *Everist & Smith* 6 (BRI)*^{17}; Gilruth Plains, Dec 1940, *Allen* 20 (CANB)*^{17}; 25 miles (*c*.40km) N of Augathella, 25°4-'S, 145°3-'E, Dec 1961, *Cull* s.n. (BRI). Maranoa District: Maranoa River, on range bearing SW of camp, Sep 1846, *Mitchell* s.n. (BM); Boorara near Yalleroi, 24°05'S, 145°35'E, Dec 1935, *Everist* 1461 (BRI); 20 miles (*c*.32 km) NE of Surat on Yuleba Rd, 26°55'S, 149°15'E, Aug 1956, *Everist* 5819 (BRI); 70 miles (*c*.112 km) SE of Charleville, 'Wheatleigh', Boatman, 27°10'S, 146°50'E, Jul 1962, *Ebersohn* E73 (BRI); 9 miles (*c*.14.4 km) W of Mitchell, in 1970, *Hanger* s.n. (BRI). Darling Downs District: about 40 km N of Goondiwindi along Leichhardt Highway (28°20'S, 150°17'E), Feb 1983, *Telford* 9515 & *Butler* (CANB); Broadwater Lagoon, Dalby, 27°21'E, 151°06'E, Nov 1985, collector unknown [AQ398749] (BRI); 15 km SE of Inglewood, 28°30'S, 151°11'E, Oct 1993, *Halford* Q1988 (BRI). **New South Wales**. Narran Swamps (29°—'S, 147°—'E), Mar 1846, *Mitchell* 50 (CGE, K); Lachlan River (33°13'S, 147°20'E), in 1881, *Ramsay* [MEL1537973] (MEL); Bourke to Barrington Road, Nov 1893, collector unknown [NSW193735] (NSW)*^{17}; Bourke (30°05'S, 145°56'E), in 1896, *McDougall* [NSW193740] (NSW)*^{17}; ditto, Dec 1939, *Beuzeville* s.n. (NSW)*^{17}; Coolabah (31°05'S, 146°38'E), Dec 1898, *Peacock* s.n. (NSW)*^{17}; Narrabri, Nov 1899, *Maiden* s.n. (NSW); Boppy Mountain, 28 miles (*c*.45 km) E of Cobar, towards Nyngan (31°32'S, 146° 17'E), Nov 1903, *Boorman* [NSW193727] (NSW); ditto, Oct 1972, *Sikkes* 169 & *Telford* (CANB)*^{17}; Nyngan (31°39'S, 147°12'E), Jan 1905, *Rogers* s.n. (NSW)*^{17}; Warialda (29°32'S, 150°35'E), Jul 1905, *Bowman* s.n. (NSW); Cobar (31°30'S, 145°50'E), in 1910, *Abrahams* [NSW193728] (NSW)*^{17}; Barwon River, Narrabri (30°20'S, 149°47'E), Nov 1912, *Julius* s.n. (NSW); Moree (29°28'S, 149°51'E), Apr 1919, *Gilmour* s.n. (NSW); Narrabri–Gunnedah, Sep 1926, *Welch* s.n. (NSW); Pera Bore, about 10 miles (16 km) W of Bourke, Aug 1928, *Benton* s.n. (NSW)*^{17}; 25 miles (*c*.40 km) W of Nyngan (31°33'S, 146° 46'E), Nov 1949, *Reik & Common* s.n. (CANB, K)*^{17}; Yantabulla District (28°20'S, 145°—'E), Apr 1965, *McReadie* (NSW)*^{17}; 30 km NNW of Cobar, 0.5 km N of Little Tank (31°15'S, 145°15'E), Sep 1978, *Crisp* 4232 (CBG); Castlereagh River (30°—'S, 147°—'E), date unknown, *Blake* [MEL1537974] (MEL).

Distribution and habitat: In drier parts of western Queensland and New South Wales, from near Emerald, central Queensland to Lachlan River, New South Wales; on sandy plains, sandy ridges usually on red or yellow sand, or on clay or on hard ridges, in open woodlands, usually occurring in small groups. **(Map 13)**

Diagnostic attributes: *Psydrax oleifolia* as circumscribed here is a very variable species which is characterised by thick, dull, obscurely or distinctly nerved, concolorous, elliptic or narrow elliptic leaves which are without reticulate veins and usually without domatia, and by its usually small, compact inflorescences with short peduncles and pedicels, and usually small flowers and fruits.

Variability: The shape and size of leaf blades, inflorescences and flowers, and the distinctness of nerves on the leaf surface are all very variable in the specimens available for study. Two distinct forms and a number of subforms are distinguishable but, as they are all connected by intermediate forms throughout their range, they are not formally recognised here. The distinct forms are as follows.

(1) *Typical form:* Specimens with narrow, elliptic oblong or subobovate leaf blades, usually obscure, suboblique or subpatent nerves, shortly stalked, comparatively small inflorescences, usually comparatively small flowers and obovoid fruits, as represented by those indicated *^{17} in the above list (which resemble the type specimen), are typical of this species. The majority of specimens from New South Wales seen, especially those from the north-west plains of that state, are of this form. It is usually found on sandy plains, undulating country or sandy ridges and hillsides, in red or yellow sandy soil.

(2) *Broad-leaved form:* The majority of specimens seen are of this form. They differ from the typical form by their usually comparatively broader, larger or longer, elliptic or elliptic-oblong leaf blades with distinct oblique nerves, usually larger inflorescences and larger flowers on longer stalks. This form usually occurs on heavy (clay) soils and hard ridges or sometimes on sandy ridges. It is reported to occur in association with Brigalow (*Acacia harpophylla* F.Muell. ex Benth.: Mimosaceae), whereas the typical form has not been reported as occurring in such a community.

However, as indicated above, these forms are connected by intermediates, namely specimens with larger or broader leaf blades with indistinct nerves and large open or small congested inflorescences, or specimens with the small or narrow leaf blades of the type specimen but with distinct nerves and often larger inflorescences. In addition, these forms also sometimes grow sympatrically making it extremely difficult to delimit them.

In addition, the broad-leaved form often intergrades into *P. attenuata* and *P. longipes*, and is, therefore, often difficult to delimit from those species as well.

***Notes*:** *Psydrax oleifolia* is related to *P. forsteri, P. johnsonii, P. longipes* and *P. saligna* and some of the specimens cited under those species here were previously filed under the names *P. oleifolia*, *P. attenuata* or *P. buxifolia* (now applicable to a subspecies of *P. odorata)* in various herbaria. *P. oleifolia* may be distinguished from all these species as indicated below.

(1) *P. oleifolia* and *P. attenuata* may be distinguished using the key under the latter species above.

(2) *P. oleifolia* and *P. forsteri* may be distinguished by the comparatively small leaves and the 5–17-flowered inflorescences of the latter species (see the key under *P. forsteri*).

(3) *P. oleifolia* and *P. johnsonii* have similar leaves, inflorescences and flowers, but the latter differs from *P. oleifolia* in its foveolate leaves and hairy branchlets and inflorescence axes (see the key under *P. johnsonii*).

(4) *P. oleifolia* and *P. longipes* may be distinguished by the long petioles, the usually broader, often foveolate leaf blades with prominent lateral and reticulate nervation, and the larger flowers of the latter species, as in the key to the *Psydrax oleifolia* group above. However, specimens of *P. oleifolia* with wider elliptic leaf blades or longer or larger leaves which are distinctly nerved with oblique nerves are often difficult to separate from *P. longipes*, except that in *P. oleifolia* the petioles are relatively shorter, the lateral nerves do not extend to the apex of the leaf as in *P. longipes*, and both reticulate veins and domatia are usually absent on the leaf blades. The species are also connected by intergrades, for example specimens with narrow leaf blades, obscure nerves and prominent domatia, or specimens with wide leaf blades, prominent nerves and domatia but without obvious reticulate venation.

(5) *P. oleifolia* and *P. odorata* subsp. *buxifolia* may be distinguished using the following key.

Leaf blades shiny, discolorous; branchlets and inflorescence axes hairy;
pedicels stout; corolla fleshy .... **P. odorata** subsp. **buxifolia**
Leaf blades dull, concolorous; branchlets and inflorescence axes glabrous;
pedicels slender; corolla thin .... **P. oleifolia**

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(6) *P. oleifolia* and *P. saligna* may be segregated using the key under the latter species above.

***Common names*:** wild lemon, native orange or myrtle tree.

***Uses*:** *Psydrax oleifolia* is reported by collectors as being a good fodder for stock and that sheep are partial to it.

20. Psydrax longipes S.T.Reynolds & R.J.F.Hend., **sp. nov.** *P. oleifoliae* (Hook.f.) S.T.Reynolds & R.J.F.Hend. affinis a qua imprimis differt foliorum petiolo longiore lamina majore latiore nervis prominentibus, venatione reticulata ornatis, floribus majoribus pedicellis longioribus. **Typus**: Queensland. PORT CURTIS DISTRICT: Larcom Gully, Calliope Shire, 23°44’S, 150°53’E, 24 November 1987, *N. Gibson* 1057 (holo: BRI).

Canthium sp. (Larcom Gully N.Gibson 1057), S.T. Reynolds (1997, p.180), P.I. Forster & D.A. Halford (2002, p.174).

Shrubs or small trees 3–7 m high; trunk with bark greyish, slightly blotched, rough and tessellated proximally, smooth distally; branches usually divaricate; branchlets terete or subterete, whitish or greyish coloured mottled with white. **Leaves** opposite; stipules ovate, keeled, attenuated into a short or long folded lobe distally; petioles 1.2–2.5 (–3.5) cm long; blades elliptic, obovate or subobovate, (6.0–) 8.0–10.0 cm long × (1.7–) 2.6–4.0 cm wide, with apex obtuse, rounded or subacute and base acute or subacute and attenuate and decurrent into the petiole, thick coriaceous, with adaxial and abaxial surfaces glabrous, pale green or yellowish green when fresh, drying yellowish green or brownish coloured; lateral nerves in 2 or 3 pairs, arched and ascending, or acutely angled to the midrib, ascending to near apex of the lamina, the adaxialmost pairs usually forming a distinct loop, prominent on adaxial surface, usually indistinct abaxially; reticulate venation fine, open, usually distinct; domatia present at least on one or two leaves of a branchlet with one or few on each side of the midrib, inconspicuous, or domatia absent. **Inflorescences** open, 2.0–2.6 cm long × 2.4–3.8 cm across, 12–28 (–39)-flowered with peduncles and pedicels drying pale yellow or reddish-brown; basal peduncle 4.0–9.0 mm long with minute bracts at its distal end; axis branches 5.0–7.0 mm long. **Flowers** 4- or 5-merous; pedicel of solitary flowers (3.0–) 5.0–7.0 mm long, that of others 1.0–3.0 (–4.0) mm long; calyx 1.0–2.0 mm long, with tube turbinate and limb 4- or 5-denticulate; corolla 7.5–9.0 (–11.0) mm long; tube campanulate, 2.0–3.5 mm long, *c.*2.5 mm wide at orifice, densely or sparsely hairy in its throat; lobes ovate-oblong or elliptic, 5.0–6.5 (–8.0) mm long × 1.0–2.0 mm wide, subacute or obtuse, erect or slightly recurved; stamens with filaments 2.0–2.5 mm long, erect, and anthers 2.0–5.0 mm long, erect; disc shorter than calyx limb, glabrous; style (with stigma) 7.0–12.0 mm long. **Fruits** ellipsoid, obscurely 2-lobed, (4.0–) 6.0–7.0 mm long × 5.0–7.0 mm across; pericarp usually exceedingly wrinkled when dry; pyrenes hemispherical or depressed ovoid, usually exceedingly rugose distally and laterally. (**Fig. 7G–7L**)

***Additional representative specimens*:** **Queensland**. Port Curtis District: Rockhampton, Nov 1865, *Dietrich* 2074 (MEL); Dawson Highway, Calliope Shire, 24°—'S, 151°1-'E, Jan 1983, *Gibson* 494 (BRI); The Springs, Livingstone Shire, 22°51'S, 150°17'E, Nov 1983, *Anderson* 3602 (BRI). Burnett District: 12 km W of Mundubbera near Burnett River, 25°35'S, 151°15'E, Jun 1984, *Kent* s.n. (BRI). Wide Bay District: Nora Creina, Didcot, Biggenden Shire, 25°58'S, 151°53'E, Dec 1981, *Forster* 138B (BRI); Mt Perry, 25°27'S, 151°52'E, Dec 1986, *Forster* PIF2765 (BRI); 1 km NE of Didcot, 25°28'S, 151°52'E, Feb 1994, *Forster* PIF14809 (BRI). Maranoa District: Roma, 26°3-'S, 148°4-'E, Feb 1938, *Blake* 13284 (BRI). Darling Downs District: 7.5 km W of Chinchilla on Warrego Highway, 26°44'S, 150°34'E, Dec 1994, *McKenzie* s.n. (BRI).

***Distribution and habitat*:** Central and southeastern Queensland; usually on rocky hill slopes, gravelly ridges and rocky creek banks, in eucalypt woodlands on rocky or sandy-clay loamy soils. (**Map 10**)

***Diagnostic attributes*:** *Psydrax longipes* is characterised by its comparatively long petiolate leaves with elliptic or subobovate blades which are sometimes provided with a small domatium, its large, usually 5-merous flowers in loosely branched inflorescences, and by its very pale brown or whitish coloured branchlets.

***Affinities*:** *Psydrax longipes* is related to *P. oleifolia* and *P. attenuata* and some of the specimens cited above have been included in herbaria under either of those species names. It resembles the former species in its leaves, general aspect, whitish coloured terete branchlets, and in the colour of dried inflorescences, but *P. oleifolia* differs form it by its efoveolate, usually narrower leaves, obscure or distinct nerves without any reticulate veins between them, and usually compact, comparatively small inflorescences, small flowers and fruits (see the key to the *Psydrax oleifolia* group above). However, specimens of *P. oleifolia* with larger or wider leaf blades with distinct oblique nerves are sometimes difficult to delimit from some of the collections included here under *P. longipes*, but the latter species differs from the former by its leaves with blades with distinct reticulate veins and the usual presence of domatia on at least some leaves of a branchlet, and longer petioles. These species, however, are connected by intergrades and further study of more specimens in the field may indicate that *P. longipes* represents the extreme of the range of variation of the very variable *P. oleifolia*. Until more collections of *P. longipes* are seen, however, these species are kept distinct here because their extremes are very diverse.

Psydrax attenuata may be distinguished from *P. longipes* by its leaves with usually narrower blades, which are usually provided with domatia, and shorter petioles, its smaller flowers with longer pedicels, its brown or reddish brown usually angular young branchlets, and by its usually galled branchlets and stems (see under *P. attenuata* above). However, *P. longipes* can sometimes have narrow leaf blades approaching those of *P. attenuata* forma *megalantha*, which also has large flowers and occasional domatia on its leaves, but differs from that form by its larger flowers with shorter pedicels, shorter leaves and pale grey branchlets.

***Etymology*:** The specific epithet *longipes*, from Latin *longus*, 'long', and *pes*, 'foot', refers to the long petioles of the leaves in this species.

21. Psydrax johnsonii S.T.Reynolds & R.J.F.Hend., **sp. nov.** quoad faciem foliorum inflorescentiarumque *P. oleifoliae* (Hook.f.) S.T.Reynolds & R.J.F.Hend. maxime similis sed foliis foveolatis, inflorescentiis pubescentibus in pedunculis brevioribus portatis, floribus plerumque 5-meris differt. **Typus:** Queensland. Leichhardt District: Duaringa Shire, Berrigurra Station, about 6 km N of Tolmies, 23°32'S, 148°44'E, 9 Dec 1981, *E.R. Anderson* 2829 (holo: BRI).

Canthium sp. (Berrigurra Station E.R.Anderson 2829), S.T. Reynolds (1997, p.180), P.I. Forster & D.A. Halford (2002, p.174).

Small trees 3–8 m high, usually much branched with numerous divaricate branches; trunk with bark grey brown mottled with white, dark grey or blackish coloured, rough proximally, smooth distally; branchlets terete, dark or pale grey, drying ± yellowish coloured distally, the young branchlets minutely puberulous. **Leaves** opposite; stipules ovate, keeled, attenuate into a extended lobe distally; petioles 0.4–1.1 cm long, minutely puberulous when young; blades elliptic, narrow elliptic or subobovate, 2.6–4.5 cm long × 0.7–1.5 (–2.0) cm wide, with apex obtuse or more or less rounded, and base usually cuneate and attenuate into the petiole, thick coriaceous, glaucous, drying thick and rigid; adaxial and abaxial surfaces glabrous, or sparsely hairy in young leaves, slightly shiny to somewhat dull on adaxial surfaces, pale green to olive-brown or yellow green; lateral nerves in 2 or 3 (or 4) pairs, oblique, arched and looping at margins, obscure; reticulate venation not apparent; domatia 1–3 on each side of the midrib, usually prominent, or very rarely absent. **Inflorescences** open, 2.0–2.8 cm long × 2.0–2.8 cm wide, 22–25-flowered; peduncles slender, the basal one 12.0–15.0 mm long, usually with minute bracts towards the middle, minutely puberulous when young; axis branches divaricate, 1.0–3.0 mm long, minutely puberulous when young. **Flowers** (4 or) 5-merous; pedicel of solitary flowers 3.0–5.0 (–6.5) mm long, of others 1.0–1.5 (–2.5) mm long, minutely puberulous when young; calyx 1.0–1.5 mm long, minutely puberulous when young, with tube somewhat urceolate and limb denticulate; lobes 4, minute; corolla 5.0–6.0 mm long; tube somewhat cylindrical, 1.5–1.7 mm long, with dense long hairs at orifice; lobes elliptic or sublanceolate, 3.5–4.0 mm long × 1.0–1.5 mm wide, obtuse or subacute, erect or recurved; stamens with filaments 1.5–2.0 mm long, erect, and anthers *c.*2.0 mm long, erect or slightly recurved; disc shorter than calyx limb, glabrous; style (with stigma) 7.0–8.0 mm long, exserted; stigma oblongoid, 2-lobed distally. **Fruit** broad ellipsoid, depressed proximally and distally, 4.0–6.0 mm long × 4.5–6.5 mm across, slightly rugose when dry; pyrenes usually slightly rugose on the dorsal side. **(Fig. 8A–8E)**

***Additional representative specimens*: Queensland.** North Kennedy District: Foot Print Scrub, Fanning River Station, 19°42'S, 146°26'E, Jan 1993, *Fensham* 632 (BRI). South Kennedy District: Exmoor, 21°00'S, 148°04'E, Dec 1992, *Fensham* 640 (BRI); Mount Blackjack, 21°01'S, 147°56'E, Jan 1993, *Fensham* 639 (BRI); Bluegrass Creek, Ceitah, 21°14'S, 147°38'E, Jan 1993, *Fensham* 643 (BRI). Leichhardt District: Nogoa River, in 1890, *Foot* [MEL 1538093] (MEL); Scott's Peak, 22°51'S, 149°13'E, Jun 1951, *Everist* 4425 (BRI); 20 miles (*c.*32 km) S of Banana, 24°45'S, 150°09'E, May 1964, *Speck* 1996 (BRI, CANB, K, NSW); Cabbage Creek Crossing, 35.6 km from Cracow, 25°29'S, 150°13'E, Jul 1990, *Forster* PIF7046 (BRI); Lotus Creek, 22°24'S, 149°07'E, Feb 1993, *Fensham* 665 (BRI); 38 km NE of Taroom, 25°27'S, 150°07'E, Oct 1996, *Halford* Q3066 & *Dowling* (BRI). Port Curtis District: Callide Valley, Apr 1917, *White* s.n. (BRI); Biloela, 24°24'S, 150°30'E, Oct 1947, *Smith* 3544 (BRI, K). Burnett District: Narayan, 25°3-'S, 150°5-'E, Nov 1969, collector unknown (BRI); Murgon–Kingaroy area, 26°—S, 151°—E, Dec 1995, *Haager* s.n. (BRI).

***Distribution and habitat*:** Eastern Queensland, from Fanning River to Burnett River; in dry

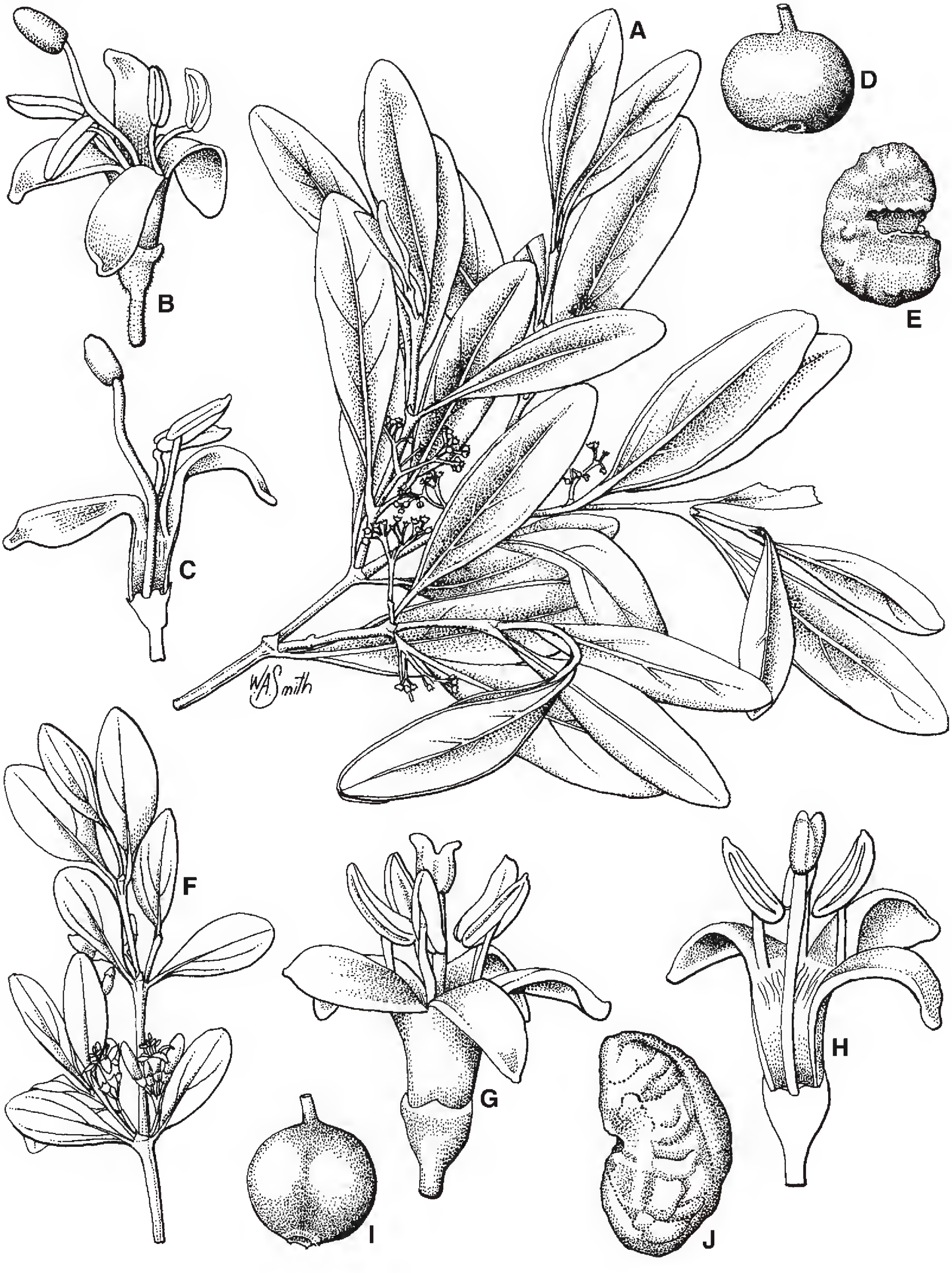

Fig. 8. ***Psydrax johnsonii***. A. flowering branch × 1. B. flower × 6. C. LS of flower × 6. D. fruit × 3. E. pyrene × 6. A, *Fensham* 643 (BRI); B–E, *Everist* 4425 (BRI). ***Psydrax forsteri***. F. flowering branch × 1. G. flower × 6. H. LS of flower × 6. I. fruit × 3. J. pyrene × 6. F, *Speck* 1819 (BRI); G&H, *Anderson* 3604 (BRI); I&J, *Kerswell* [AQ424459] (BRI).

rainforests usually on rocky hills and rocky creek beds, usually in association with Brigalow (*Acacia harpophylla* F.Muell. ex Benth.: Mimosaceae). (**Map 14**)

***Diagnostic attributes*:** *Psydrax johnsonii* is distinguishable by its foveolate, elliptic, obscurely nerved, thick, more or less dull leaf blades with prominent domatia, hairy peduncles and branchlets, and usually 5-merous flowers. It is closely related to *P. oleifolia* of which it has more or less the aspect, leaves and flowers, but differs from that species by the prominent domatia on its leaves, and hairy branchlets and inflorescence axes. Moreover, *P. johnsonii* is reported mostly as growing in a Brigalow community, usually on rocky hills or creek beds, whereas *P. oleifolia* is usually found on sandy plains and ridges, not in association with Brigalow.

***Variability*:** The leaves of *Psydrax johnsonii* are variable in the specimens available for study. Specimens with narrow, elliptic-obovate leaf blades are typical of this species whereas specimens with broader or shorter leaves (mostly from rocky situations) probably represent a distinct form of it. As many specimens are incomplete, more material, especially specimens with flowers and/or fruit, is necessary to ascertain this.

***Etymology*:** This species is named *P. johnsonii* in honour of Dr Robert William (Bob) Johnson, a former Director of the Queensland Herbarium. He was particularly interested in the '*Canthium*' species growing in association with brigalow (*Acacia harpophylla*) while studying the ecology of brigalow scrubs in central Queensland over many years.

22. Psydrax forsteri S.T.Reynolds & R.J.F.Hend., **sp. nov.** *P. oleifoliae* (Hook.f.) S.T.Reynolds & R.J.F.Hend. valde similis sed foliis minoribus, inflorescentiis paucifloris minoribus in pedunculis brevioribus portatis, floribus 5-meris differt. **Typus:** Queensland. North Kennedy District: Yahoo Waterhole, 500 m N of Warang Homestead, White Mountains National Park, 20°26'S, 144°49'E, 16 January 1995, *G. Anchen* GA174 (holo: BRI; iso: BRI).

Canthium sp. (Duaringa N.H.Speck 1819), S.T. Reynolds (1997, p.180), P.I. Forster & D.A. Halford (2002, p.174).

Shrubs or small trees 2–4 m high; trunk with bark greyish white or brown, smooth or rough; branches usually at an angle to the main axis, or more or less intricately branched; branchlets terete, whitish coloured, somewhat reddish distally when dry, glabrous. **Leaves** opposite; stipules usually ovate, keeled, attenuated into an apical lobe; petioles 0.2–0.4 cm long; blades narrow obovate or obovate-elliptic, 2.0–2.8 cm long × 1.1–1.3 cm wide, with apex obtuse, slightly rounded or ± truncate and base acute or obtuse, thick coriaceous; adaxial and abaxial surfaces glabrous, the adaxial one glossy dull green, the abaxial one pale green and dull; lateral nerves in 1 or 2 pairs, obscure adaxially, not apparent abaxially, the proximal pair arched and ascending; reticulate venation not apparent; domatia absent, or very rarely present when 1 or 2 on each leaf and inconspicuous. **Inflorescences** much shorter than the leaves, 1.0–1.7 cm long × 1.8–2.0 cm across, 5–17-flowered, with basal peduncle 0.2–0.4 cm long, terminated by 2 branched cymes and ciliated ovate bracts; cymes 2–5-flowered. **Flowers** 5-merous, strongly perfumed; pedicel of solitary flower 2.0–3.0 mm long, that of others 0.5–2.0 mm long; calyx 1.5–2.0 mm long, with tube ± cupular and limb 5-toothed; corolla 6.0–7.0 (–8.0) mm long; tube ± campanulate, 2.5–3.0 mm long, densely hairy at orifice; lobes sublanceolate, 3.0–3.5 mm long, subacute or obtuse, erect or recurved; stamens with filaments 1.5–2.5 mm long, erect; anthers 2.0–2.5 mm long, erect or ± patent; disc shorter than calyx limb, glabrous; style (with stigma) 7.0–7.5 mm long; stigma oblongoid, 2-lobed distally. **Fruits** obovoid or broad ellipsoid, 0.5–0.7 cm long × 0.55–0.6 cm across; pyrenes depressed ovoid or subellipsoid, ± deeply rugose on lateral sides, slightly rugose distally. (**Fig. 8F–8J**)

***Additional representative specimens*:** **Queensland**. Cook District: Gilbert River, date unknown, *Daintree* [MEL1538145] (MEL). Burke District: Warang Holding, White Mountains, about 37 km NNW of Torrens Creek Townships, 20°29'S, 144°49'E, Aug 1988, *Fell* 1378 & *Swain* (BRI); 55 km NE of Hughenden, at Porcupine Gorge National Park Lookout, 20°24'S, 144°26'E, Nov 1992, *Thompson* 68 & *Turpin* (BRI). North Kennedy District: Black Rock, 16 miles (*c.*25.6 km) S of Lynd Junction on Hann Highway between Hughenden and Mt Garnet, *c.*19°05'S, *c.*144°21'E, May 1970, *Webb & Tracey* 10260 (BRI); Doongara, S of Homestead, SSE of Charters Towers, 20°33'S, 146°29'E, Nov 1986, *Stuart* 117 (BRI); ditto, Mar 1989, *Forster* PIF3725 & *Bolton* (BRI); Sally's Mesa, 34 km from Greenvale on Charters Towers Road, 19°05'S, 145°14'E, Feb 1994, *Forster* PIF14972 & *Bean* (BRI). SOUTH KENNEDY DISTRICT: 61 km N of Clermount, 22°14'S, 147°08'E, Dec 1986, *Jackes* 8622 (BRI). MITCHELL DISTRICT: Enniskillen, 24°35'S, 146°05'E, Nov 1943, *White* 12358 (BRI, US). LEICHHARDT DISTRICT: 7 miles (*c.*11 km) E of Mantuan Downs, Tambo–Springsure Road, 24°25'S, 147°25'E, Apr 1946, *Everist* 2548 (BRI); 9.1 miles (*c.*14.6 km) W of Duaringa, Oct 1963, *Speck* 1819 (BRI, CANB, K, NSW); Duaringa Shire, Berrigurra Station, about 20 km NW of Blackwater, 23°32'S, 149°42'E, Nov 1983, *Anderson* 3604 (BRI, CANB, NSW); St Peter, NNW of Springsure, Sep 1984, *O'Keefe* 750 (BRI); Novrindilla homestead, 25 km NE of Dingo, 23°30'S, 149°32'E, Oct 1989, *Anderson* 4803 (BRI); Humboldt, S of Blackwater, 24°13'S, 148°57'E, Jan 1997, *Fensham* 3001 (BRI).

***Distribution and habitat*:** North and central Queensland; on sandy ridges, low hillsides, sandstone slopes, rocky outcrops, in open Eucalypt forests on red sandy loam. (**Map 8**)

***Diagnostic attributes*:** *Psydrax forsteri* is characterised by its comparatively small leaves with usually obovate-elliptic, thick, more or less dull, obscurely nerved leaf blades, and short petioles, and its 5–17-flowered inflorescences on exceedingly short peduncles. It differs from other small-leaved species of *Psydrax* in Australia by the above set of characters.

***Notes*:** *Psydrax forsteri* is related to *P. oleifolia* and *P. odorata* subsp. *buxifolia*, and some of the specimens cited above have previously been included under the names *Canthium oleifolium* or *C. buxifolium* in various herbaria. This species may be distinguished from the latter ones as follows:

1. Leaf blades exceedingly glossy on the adaxial surface; branchlets and inflorescence axes hairy; corolla coriaceous; petioles stout .... **P. odorata** subsp. **buxifolia**
   Leaves somewhat shiny or dull on the adaxial surface; branchlets and inflorescence axes glabrous; corolla chartaceous; petioles slender 2

2. Leaves with blades 2.0–2.8 cm long × 1.1–1.3 cm wide; inflorescence with axis not branched, 5–17-flowered; flowers 5-merous; petioles 0.2–0.4 cm long .... **P. forsteri**
   Leaves with blades 3.5–6.5 (–8.5) cm long × 0.7–2.4 (–3.3) cm wide; inflorescence with axis branched, 23–39-flowered, the flowers congested on short branches; flowers mostly 4-merous; petioles 0.6–1.2 (–1.7) cm long .. **P. oleifolia**

The leaves of *Psydrax forsteri* are variable. Specimens with usually comparatively small, obovate-elliptic or narrow obovate leaf blades are typical of this species. However, specimens with narrower leaves, namely the collections from Porcupine Gorge, White Mountains and Sally's Mesa cited above, possibly represent a distinct form of it but more material and field observations/notes would be necessary to be certain of this.

Etymology: This species is named *P. forsteri* in honour of Mr Paul Forster, a botanist on the staff of the Queensland Herbarium. His collections of various '*Canthium*' species from throughout Queensland have been most valuable in gaining an understanding of some of the *Psydrax* species complexes. Most of the illustrations provided in this paper are drawn from his collections housed in BRI.

Acknowledgements

We thank Les Pedley and Peter Bostock for assistance with the Latin diagnoses, colleagues at BRI for collecting material of many of the '*Canthium*' species and for their comments about the habitat of these species, Paul Flower for his collections and photographs of *P. odorata* from Vanuatu, Clyde Dunlop for his comments on the manuscript, and Laurie Jessup, Gordon Guymer and Clyde Dunlop for their assistance in locating specimens and photographing types and literature during their term as Australian Botanical Liaison Officer at Kew Gardens, England. Diane Bridson is

thanked for her comments on *Psydrax* and *Canthium*, and for assistance with specimens during visits to K (S.T.R. and, later, R.J.F.H.), Will Smith for the illustrations and maps, David Halford and Kym Sparshot for assistance with measurements, maps and illustrations, and the Directors/Keepers of herbaria AD, BM, CANB, CGE, DNA, K, L, MEL, NSW, P, PERTH, PVNH, QRS and UNSW for allowing me (S.T.R.) full access to specimens in their institutions and for the loan of herbarium material. The Australian Biological Resource Study, ABRS, Environment Australia, is thanked for a grant (to S.T.R. in the 1990s) to undertake research in the genus '*Canthium*' in Australia.

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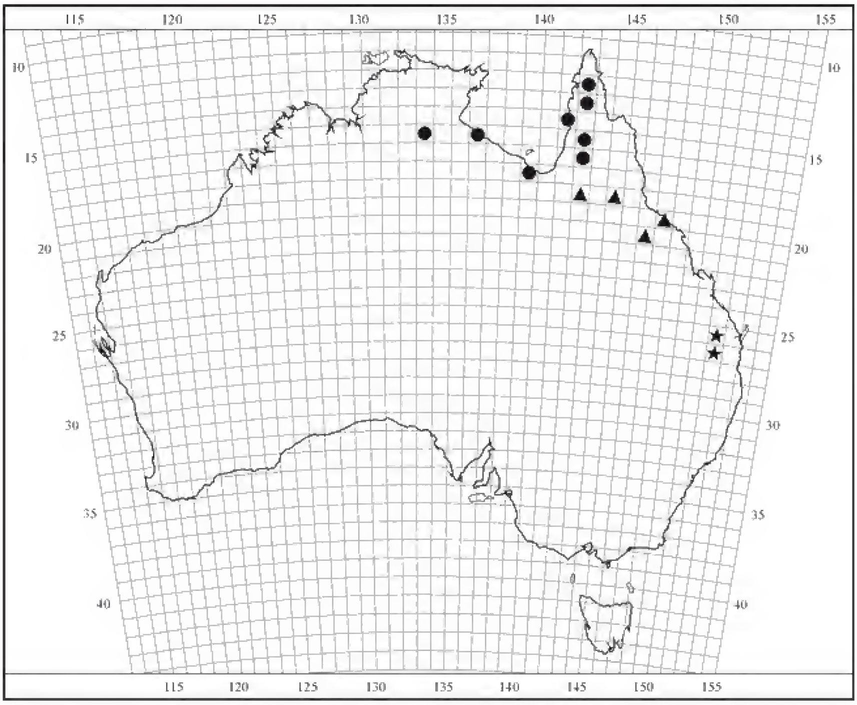
Supplement A

Currently accepted names for Australian taxa previously considered to belong in *Canthium* Lam. or *Plectronia* L. are as follows. Numbers (and letters) where given with the currently accepted name refer to the relevant position of the taxon concerned in the above revision. Accounts of *Everistia* or *Cyclophyllum* taxa may be found in Reynolds & Henderson (1999 or 2001).

Previous identification	**Currently accepted name**
Canthium attenuatum Benth.	15. **Psydrax attenuata**
Canthium attenuatum sensu G. Bentham (1867) pro parte	18. **Psydrax pendulina**
Canthium attenuatum sensu G. Bentham (1867) pro parte	17. **Psydrax saligna**
Canthium attenuatum sensu G. Bentham (1867) pro parte	19. **Psydrax oleifolia**
Canthium brevipes Merr. & L.M.Perry	**Cyclophyllum brevipes**
Canthium buxifolium Benth.	6d. **Psydrax odorata** subsp. **buxifolia**
	6d(i). **Psydrax odorata** forma **buxifolia**
Canthium buxifolium forma (Brigooda P.I.Forster PIF5657)	6d(iii). **Psydrax odorata** subsp. **buxifolia 'Mundubbera form'**

Canthium buxifolium var. (Mt Alford L.H.Bird AQ408941) . . 6d(ii). **Psydrax odorata** forma **parviflorifra**
Canthium coprosmoides F.Muell . . . . **Cyclophyllum coprosmoides**
Canthium costatum C.T.White . . . . **Cyclophyllum costatum**
Canthium cymosum sensu F. Mueller (1875, 1882 &1889). . . . . 7b. **Psydrax lamprophylla** forma **latissima**
Canthium didymum sensu F. Mueller (1875) & F.M. Bailey (1900) pro parte . . . . 7b. **Psydrax lamprophylla** forma **latissima**
Canthium graciliflorum Merr. & L.M.Perry . . . . 2. **Psydrax graciliflora**
Canthium lamprophyllum F.Muell . . . . 7. **Psydrax lamprophylla**
Canthium latifolium F.Muell. ex Benth . . . . 11. **Psydrax latifolia**
Canthium lineare E.Pritz . . . . 3. **Psydrax suaveolens**
Canthium lucidum Hook. & Arn., nom. illeg. non R.Br. . . . . 6. **Psydrax odorata**
Canthium lucidum sensu G. Bentham (1867) pro parte . . . . 7. **Psydrax lamprophylla**
Canthium microphyllum F.Muell . . . . **Everistia vacciniifolia** var. **nervosa**
Canthium odoratum subsp. (Didcot P.I.Forster PIF14127) . . . . . . 6c. **Psydrax odorata** subsp. **australiana**
Canthium odoratum forma (Texas P.I.Forster PIF14257) . . . . . . 6c(iii). **Psydrax odorata** forma **subnitida**
Canthium oleifolium Hook.f. . . . . 19. **Psydrax oleifolia**
Canthium oleifolium sensu G. Bentham (1867) pro parte . . . . 17. **Psydrax saligna**
Canthium oleifolium var. *pedunculatum* Maiden & Baker . . . . . . 6c(iii). **Psydrax odorata** forma **subnitida**
Canthium schultzii (O.Schwarz) Chippendale . . . . **Cyclophyllum schultzii**
Canthium sp. (Altanmoui Range D.G.Fell+ DGF2702) . . . . 2. **Psydrax graciliflora**
Canthium sp. (Berrigurra Station E.R.Anderson 2829) . . . . 21. **Psydrax johnsonii**
Canthium sp. (Cooktown V.Scarth-Johnson AQ314008) . . . . 16. **Psydrax lepida**
Canthium sp. (Cooroy S.T.Blake+ 15507) . . . . **Cyclophyllum longipetalum**
Canthium sp. (Copper-Lode Falls C.H.Gittins 2211) . . . . **Cyclophyllum protractum**
Canthium sp. (Dixie Station S.T.Garnett 1545) . . . . 14. **Psydrax pallida**
Canthium sp. (Duaringa N.H.Speck 1819) . . . . 22. **Psydrax forsteri**
Canthium sp. (Friday Island L.J.Brass 18158) . . . . 10. **Psydrax banksii**
Canthium sp. (Headingly Station R.A.Perry 848) . . . . 12. **Psydrax ammophila**
Canthium sp. (Herberton Range S.F.Kajewski 1377) . . . . 8. **Psydrax laxiflorens**
Canthium sp. (Kuranda G.Sankowsky+ 680) . . . . **Cyclophyllum multiflorum**
Canthium sp. (Larcom Gully N.Gibson 1057) . . . . 20 **Psydrax longipes**
Canthium sp. (Lizard Island R.L.Specht+ LI181) . . . . **Cyclophyllum maritimum**
Canthium sp. (Massy Creek P.I.Forster+ PIF10568) . . . . **Everistia vacciniifolia**
Canthium sp. (Mt Alford L.H.Bird AQ408941) . . . . 6d(ii). **Psydrax odorata** forma **parviflorifra**
Canthium sp. (Mt Rose A.R.Bean 1978) . . . . **Cyclophyllum rostellatum**
Canthium sp. (Thornton Peak H.Flecker NQNC7110) . . . . 5. **Psydrax montigena**
Canthium sp. (Thursday Island E.Cowley 10) . . . . 13. **Psydrax reticulata**
Canthium sp. (Weipa, A.Morton AM1773) . . . . 1. **Psydrax paludosa**
Canthium sp. (Wenlock River, J.R.Clarkson 8418+) . . . . 1. **Psydrax paludosa**
Canthium sp. (Whitfield Range B.P.Hyland 1020) . . . . 9. **Psydrax tropica**
Canthium sp.A, Koch, B.L. in J.R. Wheeler (1992) pro parte . . . . 18. **Psydrax pendulina**
Canthium sp. 1., Ross, E.M. in T.D. Stanley & E.M. Ross (1986) . . . . 7. **Psydrax lamprophylla**
Canthium suaveolens S.Moore . . . . 3. **Psydrax suaveolens**
Canthium vacciniifolium F.Muell. . . . . **Everistia vacciniifolia**
Plectronia attenuata (Benth.) C.A.Gardner . . . . 15. **Psydrax attenuata**
Plectronia barbata sensu F. Mueller (1875) . . . . **Cyclophyllum coprosmoides**
Plectronia coprosmoides var. *spathulata* O.Schwarz . . . . . **Cyclophyllum coprosmoides** var. **spathulatum**
Plectronia diococca sensu F. Mueller (1875) pro parte . . . . 7b. **Psydrax lamprophylla** forma **latissima**
Plectronia hookeriana Domin . . . . 6. **Psydrax odorata**
Plectronia hookeriana var. *dietrichiae* Domin . . . . **Tarenna** sp.
Plectronia linearis (E.Pritz.) J.M.Black . . . . 3. **Psydrax suaveolens**
Plectronia odorata var. *reticulata* C.T.White . . . . 13. **Psydrax reticulata**
Plectronia schultzii O.Schwarz . . . . **Cyclophyllum schultzii**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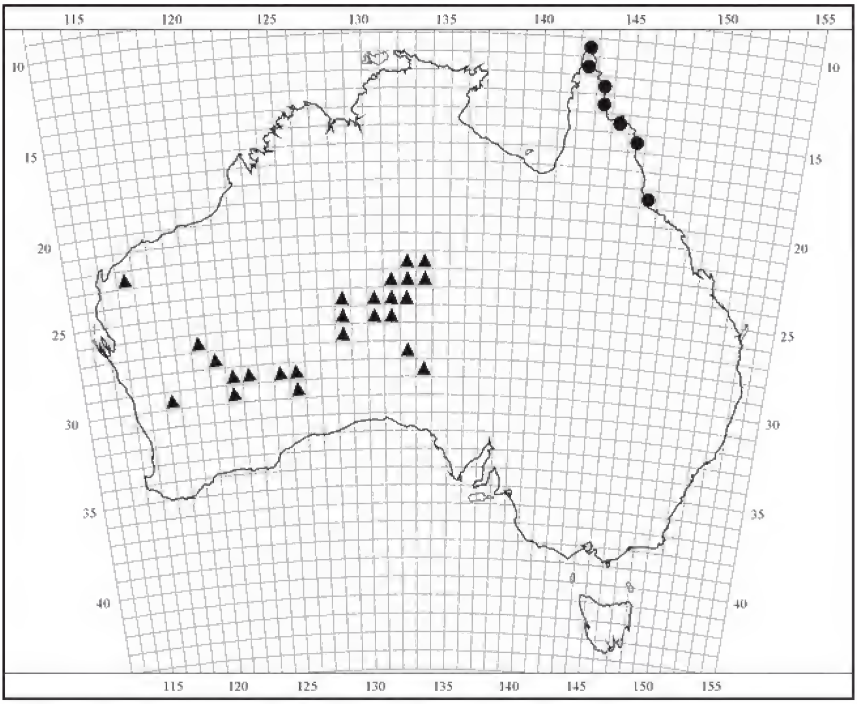
Map 1. Distribution of *Psydrax odorata* subsp. *australiana* (40 Mile Scrub form) ▲ , *Psydrax odorata* subsp. *buxifolia* (Mundubbera form) ★ and *Psydrax paludosa* ● .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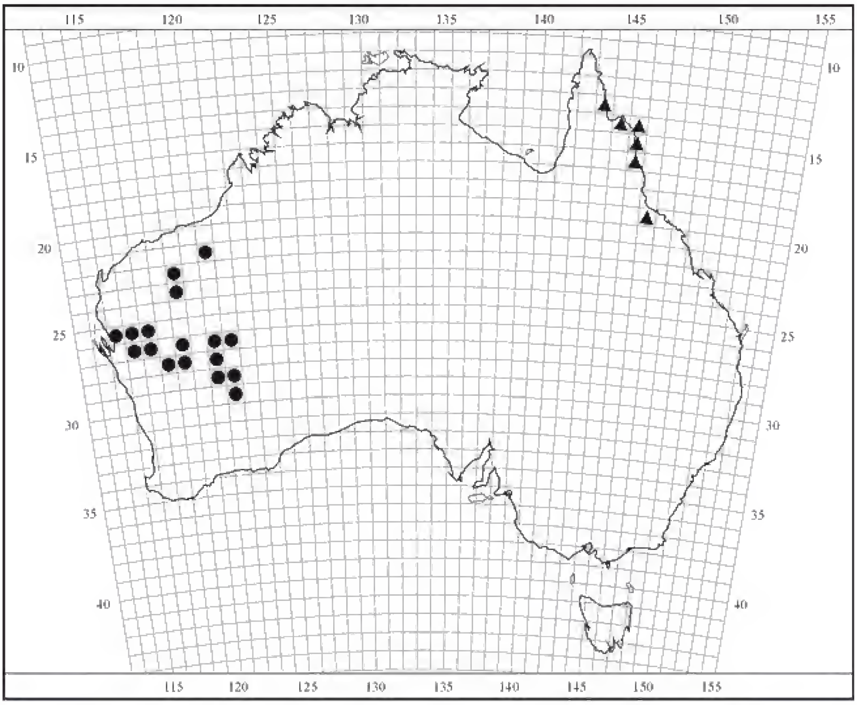
Map 2. Distribution of *Psydrax graciliflora* ● *and Psydrax suaveolens* ▲.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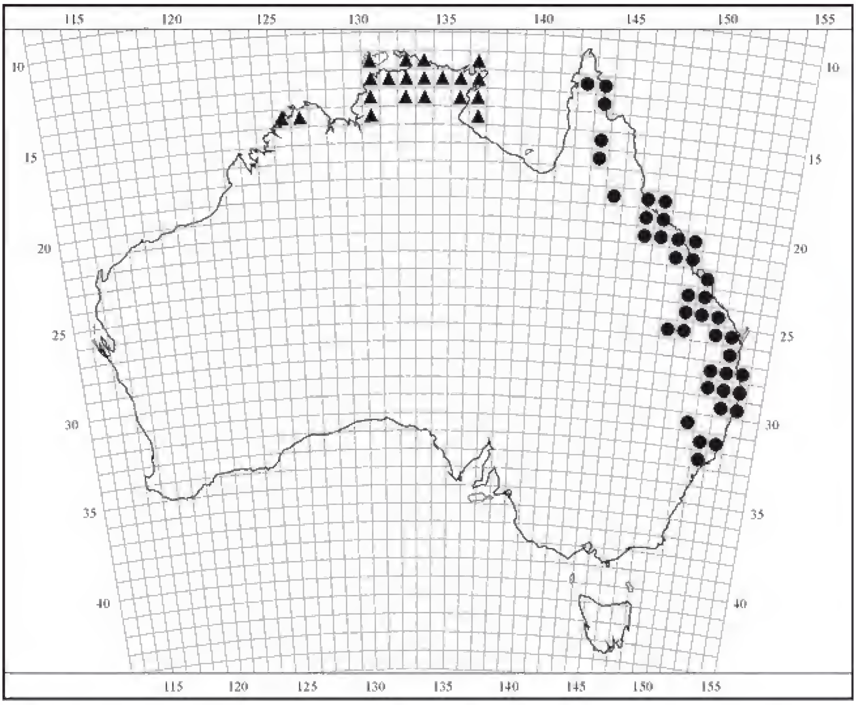
Map 3. Distribution of *Psydrax odorata* subsp. *australiana* (*P. odorata* forma *foveolata* ▲) and *Psydrax rigidula* ● .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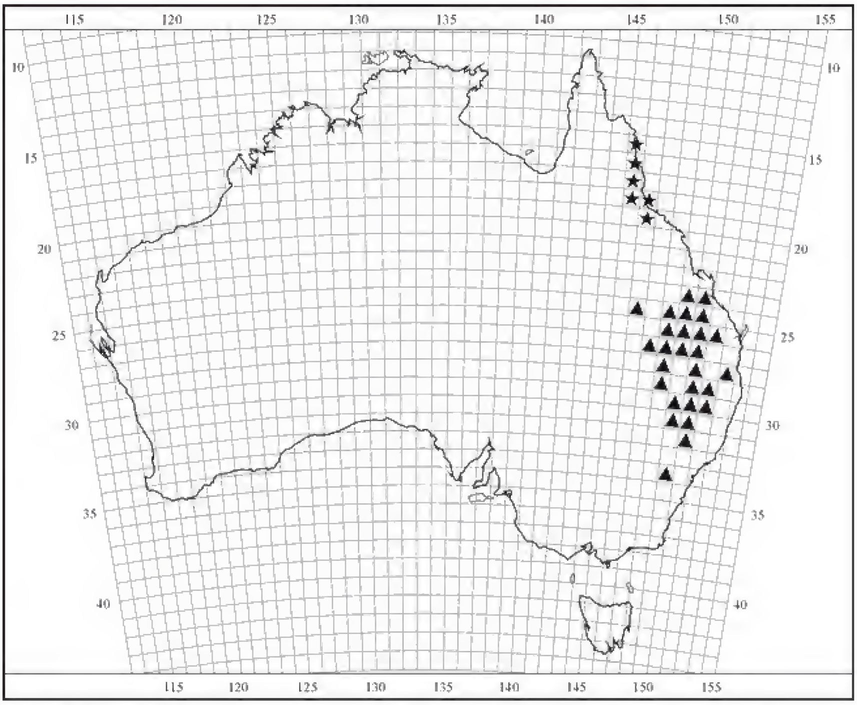
Map 4. Distribution of *Psydrax odorata* subsp. *arnhemica* ▲ and *Psydrax odorata* subsp. *australiana* (*P. odorata* forma *australiana* ●).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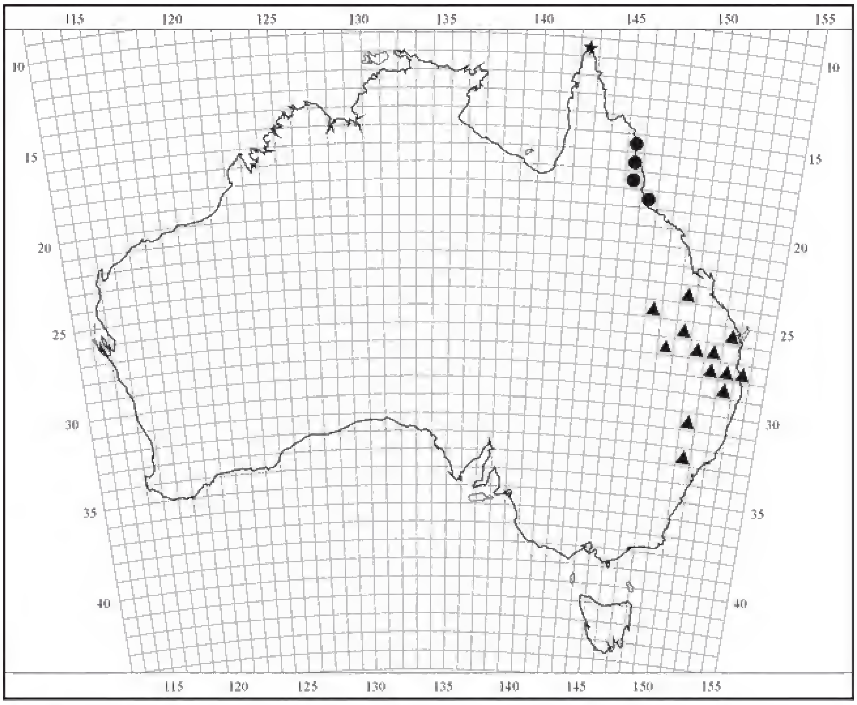
Map 5. Distribution of *Psydrax laxiflorens* ★ and *Psydrax odorata* subsp. *australiana* (*P. odorata* forma *subnitida* ▲).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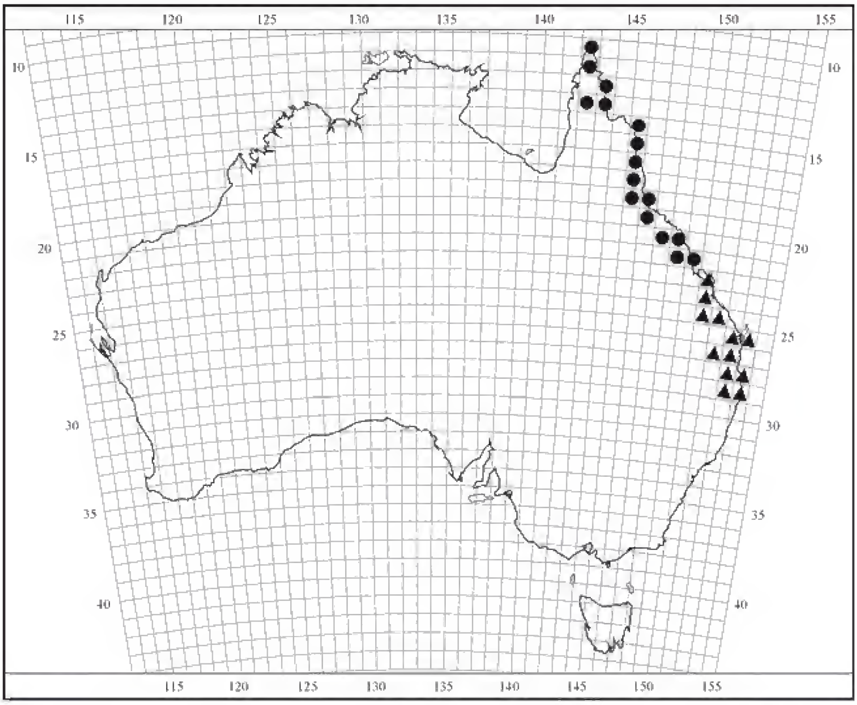
Map 6. Distribution of *Psydrax montigena* ● , *Psydrax odorata* subsp. *buxifolia* (*P. odorata* forma *buxifolia* ▲) and *Psydrax reticulata* ★ .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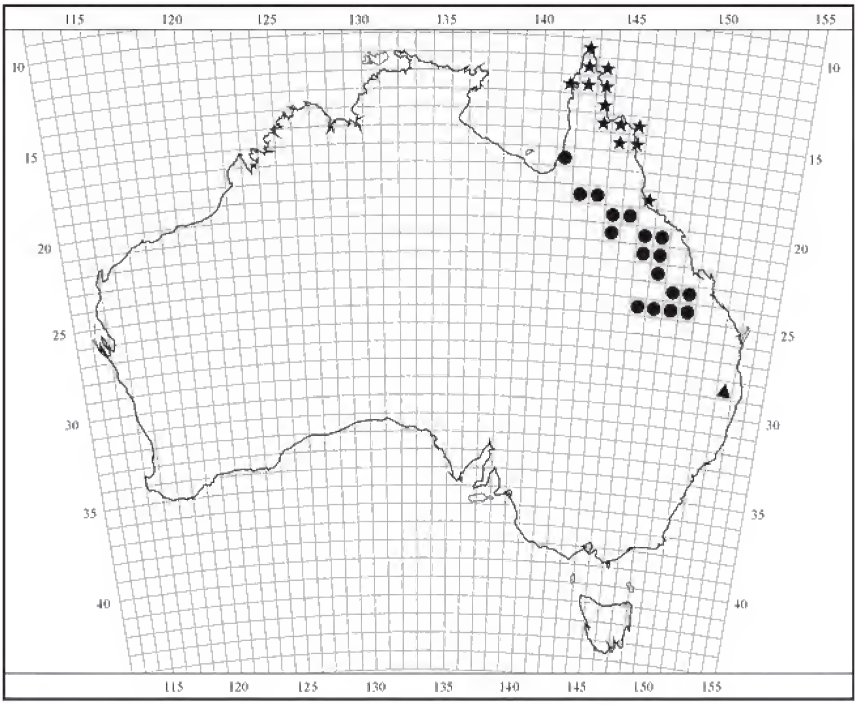
Map 7. Distribution of *Psydrax lamprophylla* (*P. lamprophylla* forma *lamprophylla* ▲ and *P. lamprophylla* forma *latissima* ●).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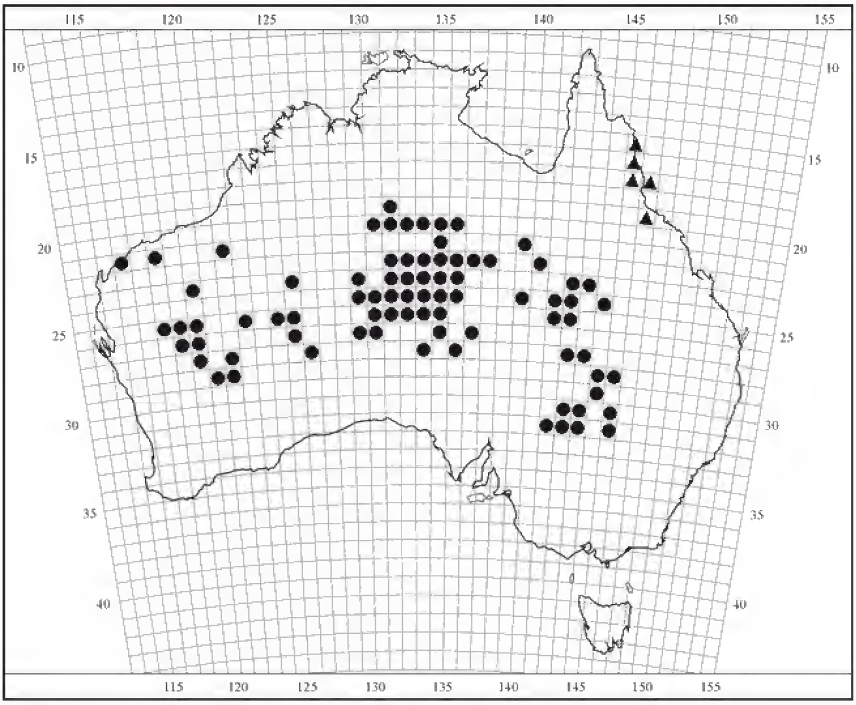
Map 8. Distribution of *Psydrax banksii* ★ , *Psydrax forsteri* ● and *Psydrax odorata* subsp. *buxifolia* (*P. odorata* forma *parviflorifra* ▲).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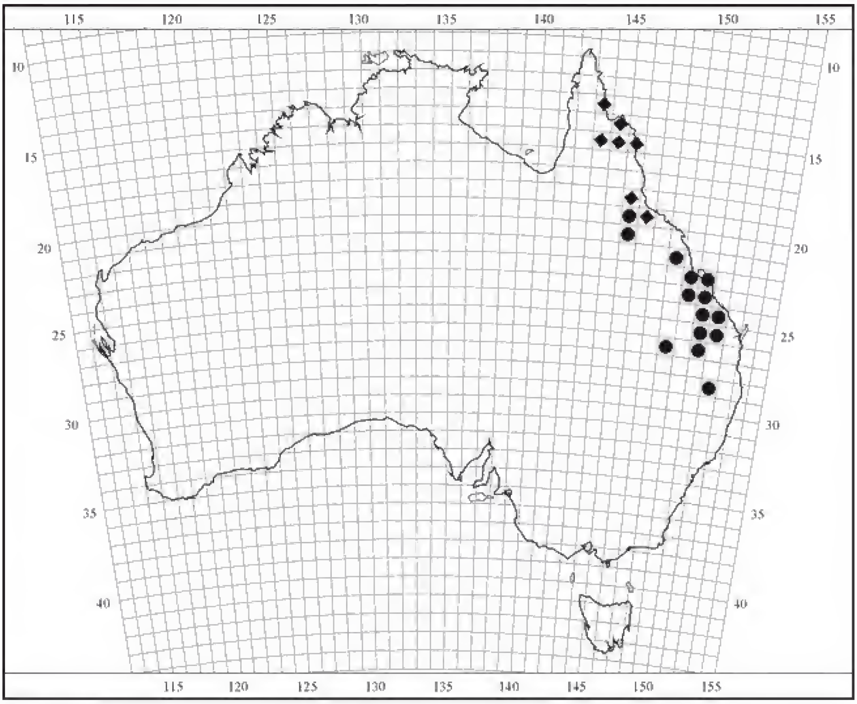
Map 9. Distribution of *Psydrax latifolia* ● and *Psydrax tropica* ▲ .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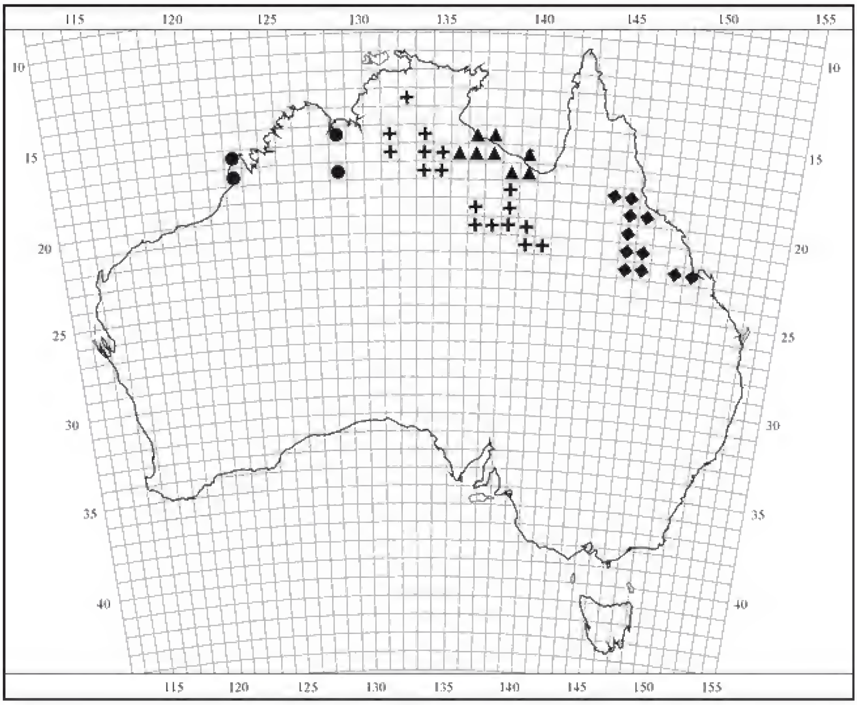
Map 10. Distribution of *Psydrax lepida* ◆ and *Psydrax longipes* ● .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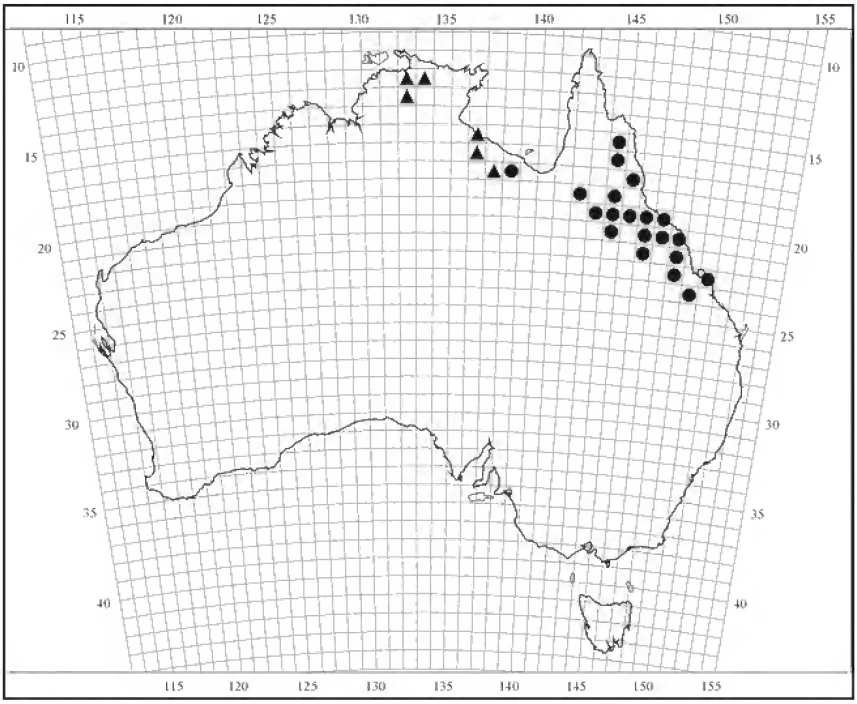
Map 11. Distribution of *Psydrax attenuata* var. *attenuata* ▲ , *Psydrax attenuata* var. *myrmecophila* (*P. attenuata* forma *megalantha* ◆ and *P. attenuata* forma *myrmecophila* ✚) and *Psydrax attenuata* var. *tenella* ● .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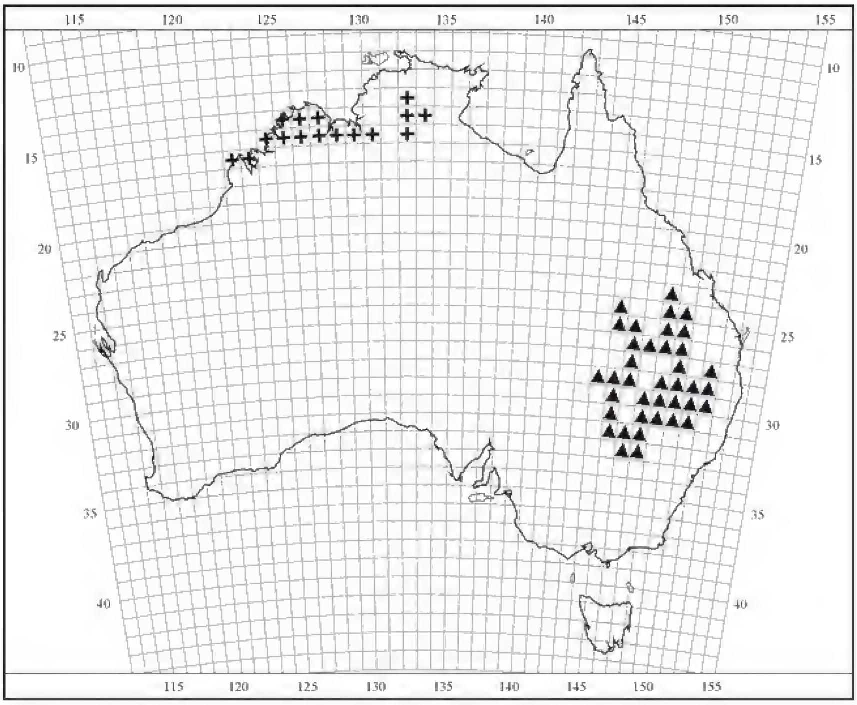
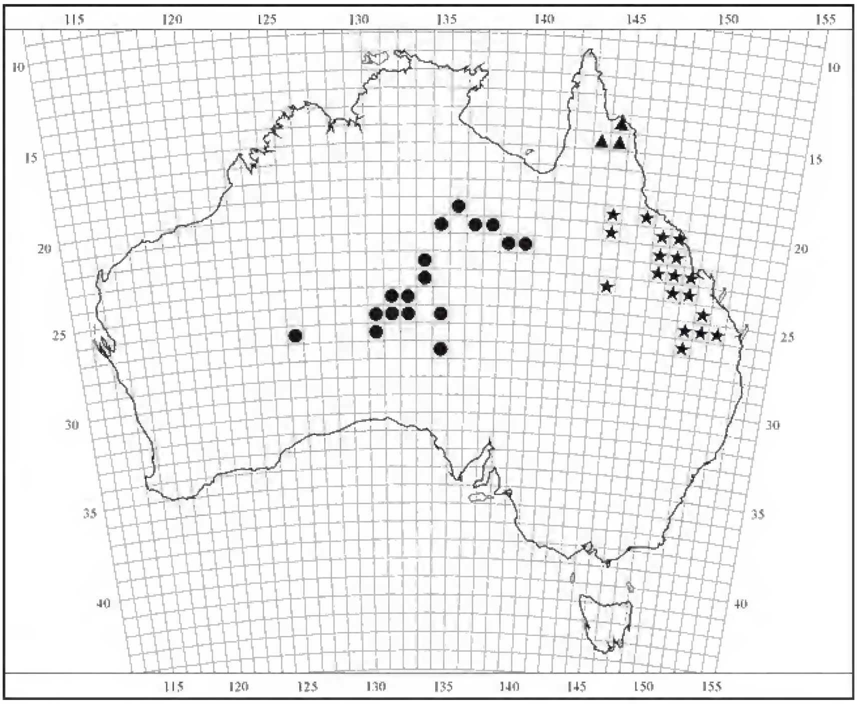
Map 12. Distribution of *Psydrax saligna* (*P. saligna* forma *filiformis* ▲ and *P. saligna* forma *saligna* ●).



Map 13. Distribution of *Psydrax oleifolia* ▲ and *Psydrax pendulina* ✚ .



Map 14. Distribution of *Psydrax ammophila* ● , *Psydrax johnsonii* ★ and *Psydrax pallida* ▲ .

Appendix 1

There are two species related to those dealt with in the above account of *Psydrax* in Australia which do not occur on this continent but which are referred to in our account for comparison purposes. As we consider these species also belong in this genus but they lack a name under *Psydrax*, we provide the following new combinations for them.

Psydrax cymigera (Valeton) S.T.Reynolds & R.J.F.Hend., **comb. nov.**; *Plectronia cymigera* Valeton, *Engl. Bot. Jahrb.* 61: 54 (1927); *Canthium cymigerum* (Valeton) B.L.Burtt, *(Kew) Bull. Misc. Information* 1936: 463 (1936). **Type:** Northeast New Guinea. In den Wälden des Maboro, May 1909, *Schlechter* n.17513 (?19513) (holo: n.v.; iso: ?A., fide Merrill & Perry (1945), ?K, fide B.L.Burtt, *loc. cit.*).

The situation regarding the numbering (or possible mis-numbering) of parts of the type collection has been commented upon by Merrill and Perry (1945). *Psydrax cymigera* is related to *P. lamprophylla*.

Psydrax suborbicularis (C.T.White) S.T.Reynolds & R.J.F.Hend., **comb. nov.**; *Plectronia suborbicularis* C.T.White, *Proc. Linn. Soc. N.S.Wales* 51: 296 (1926); *Canthium suborbiculare* (C.T.White) Merrill & Perry, *J. Arnold Arb.* 26: 230 (1945). **Type**: Papua New Guinea. Rigo District, *R. Lister Turner* (holo: BRI).

Psydrax suborbicularis is related to *P. banksii* and *P. reticulata*.

A new species of *Gynochtodes* Blume (Rubiaceae) from north east Queensland

D.A. Halford

Summary

Halford, D.A. (2004). A new species of *Gynochtodes* Blume (Rubiaceae) from north east Queensland. *Austrobaileya* 6 (4): 891-894. *Gynochtodes sessilis* Halford is described, illustrated and compared with *Gynochtodes australiensis* J.T.Johanss. Notes on habitat and distribution are provided.

Key words: *Gynochtodes*, taxonomy, Australian flora, *Gynochtodes sessilis*, Rubiaceae

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Introduction

Johansson (1988) reported the genus *Gynochtodes* Blume from Australia for the first time with the description of *G. australiensis* J.T.Johanss. based on material from the headwaters of East Alligator River in the Northern Territory. In his circumscription of this species he included two collections from north eastern Queensland, namely *A.S. & M.G. Thorsborne* 337 (BRI) collected from Hinchinbrook Island and *V. Scarth-Johnson* 1109A (BRI) collected from near Bamaga. In regards to the collection from Hinchinbrook Island, he noted that it differed from the Northern Territory collections by having longer acuminate leaf-tips and more compressed inflorescences. However, Johansson considered that there was insufficient material to draw any taxonomic conclusion.

As a result of the examination of a number of fertile collections that are now available at the Queensland Herbarium (BRI) from north east Queensland I believe that the taxon represented by the collection (*A.S. & M.G. Thorsborne* 337) is specifically distinct from *G. australiensis* and is here named *Gynochtodes sessilis*.

The collection from Bamaga, *V. Scarth-Johnson* 1109A, is here maintained under the name *G. australiensis* as it has inflorescences that are shortly pedunculate. However, it differs from Johansson's circumscription of that species by its generally shorter and broader leaves, its sparse to moderately dense indumentum of erect unicellular hairs (< 0.1 mm long) on young branchlets and is reportedly a tree (collectors notes). This population warrants further study to establish the significance of these differences.

Measurements of flowers and fruit in this account are taken from material preserved in spirit at BRI. This work is part of current studies being undertaken by the author into the tribe Morindeae (Rubiaceace) in Queensland.

Gynochtodes sessilis Halford **sp. nov.** arcte affinis *G. australiensi* autem floribus fructibusque sessilibus, foliis plerumque grandioribus (9.5–19 × 3–6 (–7.5) cm comparitis 5–13 × 1.6–5 cm) apicibus longioribus acuminatis instructis, calycibus pubescentibus non glabris differt. A *G. coriacea* Bl. floribus fructibusque sessilibus, floribus comparate grandioribus, calycibus pubescentibus domatiis carentibus distinguenda. **Typus:** Queensland. Cook District: State Forest 607 Dinden, Bridle Creek track, 15 Jan 2002, *P.I. Forster* PIF28124 *R. Booth & R. Jensen* (holo: BRI; iso: A, BISH, DNA, L, MEL, MO, P, Z, distribuendi).

Gynochtodes sp. (Hinchinbrook Island A.S.Thorsborne+ 337), (Forster & Halford 2002).

Woody *liana*, becoming somewhat shrubby in open situations. *Young branchlets* terete, glabrous, smooth. *Stems* blackish in colour with wart-like lenticels. *Bark* and sapwood becoming purple to dark violet when cut. *Raphides* present. *Stipules* interpetiolar, sheathing, with

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short triangular lobe, 1–2 mm long, chartaceous, glabrous except for minute hairs (< 0.2 mm long) on margin, fragmenting as node thickens. *Leaves* decussate, glabrous, usually drying black; petioles plano-convex, 1–2 cm long; laminae narrowly obovate to obovate or narrowly elliptic to elliptic, 9.5–19 cm long, 3–6 (–7.5) cm wide, length/width ratio 2–3:1, coriaceous, glossy dark green adaxially and paler abaxially when fresh, turning ± black when dried; base obtuse to broadly cuneate; margins entire; apex obtuse or usually acuminate with acumen up to 1 cm long; venation brochidodromous, with midrib raised slightly adaxially and strongly abaxially when dried; lateral, intramarginal and interlateral veins slightly raised on both surfaces when dried; lateral veins 7–10 per side of midrib, at c. 60–70° to the midrib; intramarginal veins 2–4 mm from margin; interlateral veins reticulate; domatia absent. *Flowers* unisexual (?), axillary, fasciculate, with up to 12 in each cluster, sessile; calyx cup-shaped, c. 2 × 2 mm, green, sparsely hairy with minute erect hairs (< 0.05 mm long); limb c. 0.5 mm long, glabrous adaxially, truncate, with minute erect hairs on margin; corolla cream-yellow or white when fresh, turning black when dried, sparsely hairy abaxially with minute erect hairs; corolla tube ± cylindrical, 1–2.5 mm long, glabrous abaxially except for scattered minute erect hairs proximally; corolla lobes (3) 4 (5), narrowly obovate, 6–7 mm long, 1.5–3.3 mm wide, densely villose for the proximal two thirds adaxially, ± cucullate at apex; stamens 4, exserted, inserted at corolla lobe sinuses; filaments terete, 2–3 mm long, glabrous; anthers oblong c. 2.7 mm long; ovary bilocular, ovules 2 in each locule, with false septum in the upper part appearing to divide each into 2, funicule inserted at base of dissepiment; style absent; stigma bifid, c. 0.2 mm long. *Fruit* a drupe, globose to ellipsoid, 12–14 mm long, 9–14 mm diameter, 1–4-seeded, glabrous; epicarp, black, brittle; mesocarp black, pulpy with pungent aroma. **Fig. 1.**

***Selected specimens*: Queensland:** Cook District. Mt Cook NP, 0.5 km NE of summit, Feb 1993, *D.G. Fell* DGF2858 & *J.P. Stanton* (BRI); State Forest 607 Dinden, Bridle Creek track, Jan 2002, *P.I. Forster* PIF28127, *R. Booth* & *R. Jensen* (BRI); NPR 164, Parish of Noah, Oliver Creek, Jun 1987, *B. Gray* 04483 (BRI); SFR 607, Shoteel logging area, May 1982, *B. Gray* 20203v (BRI); Cairns, Hills Creek, Jan 1994, *C. Lyons* 152 (BRI). North Kennedy District. SFR 299, Conway, Cedar Creek, May 1975, *B. Hyland* 08238 (BRI); Hinchinbrook Island, Dec 1976, *A.S. & M.G. Thorsborne* 337 (BRI); upper reach of Deluge Inlet, Hinchinbrook Island, May 1972, *L.J. Webb* & *J.G. Tracey* 11186 (BRI).

***Distribution and habitat*:** Occurs in north east Queensland, where it has been collected in coastal and subcoastal areas from Mt Cook National Park near Cooktown southwards to Hinchinbrook Island, with a disjunct population in the Conway Range near Proserpine (**Map 1**). It is commonly recorded growing from near sea-level to 520 m altitude in simple or complex notophyll rainforest mostly on alluvial soils derived from various substrates.

***Phenology*:** Flowers have been recorded from June to November, fruits from April to June and August.

***Affinities*:** *Gynochtodes sessilis* is closely related to *G. australiensis* but differs from that by its sessile flowers and fruits, its generally larger leaves (9.5–19 × 3–6 (–7.5) cm compared with 5–13 × 1.6–5 cm), its longer acuminate leaf apices and its hairy rather that glabrous calyces. *Gynochtodes sessilis* can be distinguished from *G. coriacea* Blume by its sessile flowers and fruits, comparatively larger flowers, hairy calyces and lack of domatia.

***Notes*:** All flowering collections (*C. Lyon* 152; *A.S. & M.G. Thorsborne* 337; *P.I. Forster* PIF28124, *R. Booth* & *R. Jensen*; *P.I. Forster* PIF28127, *R. Booth* & *R. Jensen*) of *G. sessilis* that have been examined during this study are tentatively interpreted as having unisexual flowers as they lacked a well developed style and stigma. However, the ovaries are well developed with what appears to be functional ovules. Further flowering material is required to assess what reproductive strategies are present in this species.

The flowers of *G. sessilis* are reported to be either sweetly scented (*P.I. Forster* PIF28124, *R. Booth* & *R. Jensen*) or to have a pungent aroma (*C. Lyons* 152) at anthesis.

***Etymology*:** The specific epithet is Latin and refers to the sessile flowers and fruits of the species.

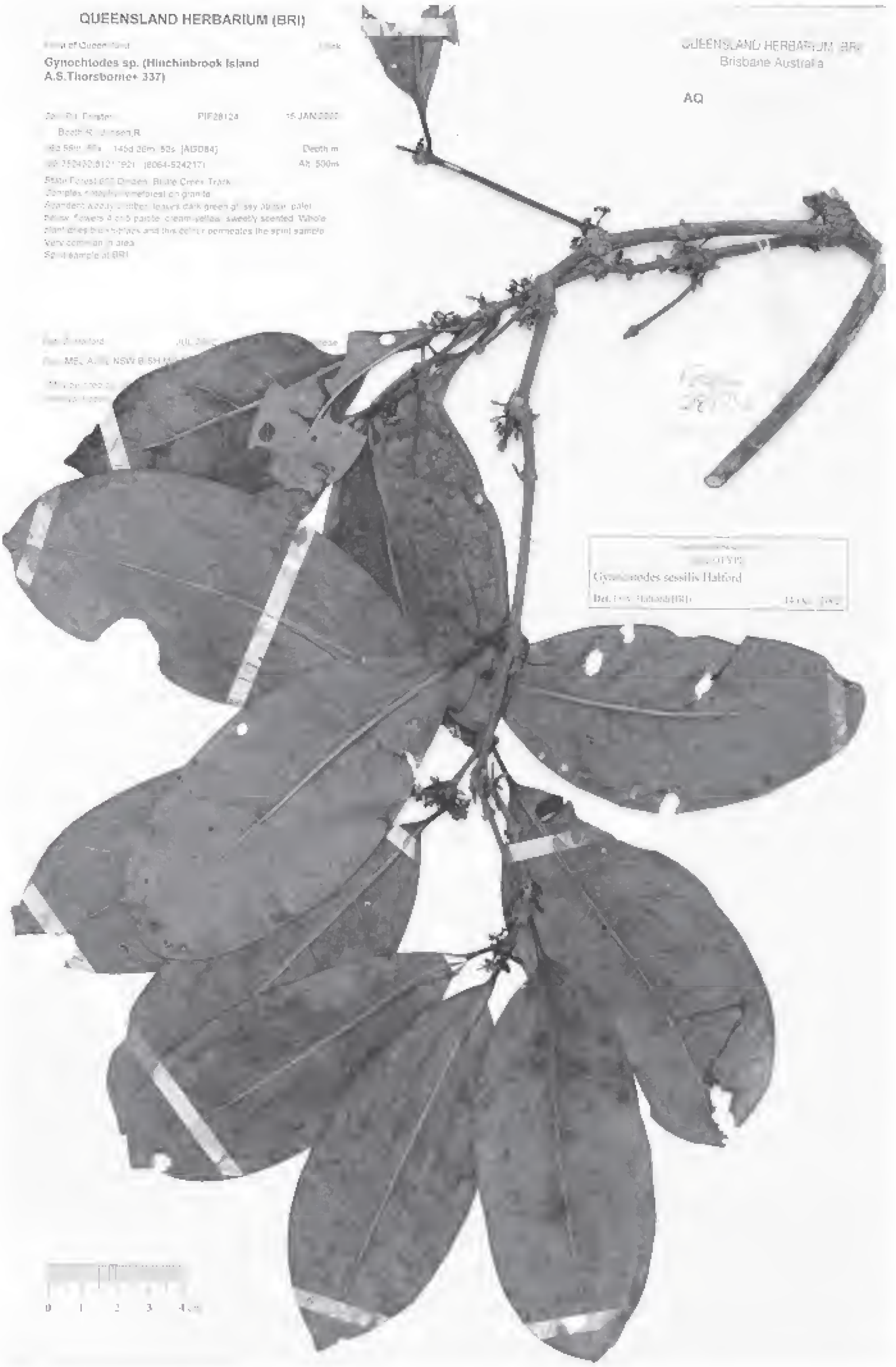
QUEENSLAND HERBARIUM (BRI)
Gynochtodes sp. (Hinchinbrook Island A.S.Thorsborne+ 337)
QUEENSLAND HERBARIUM (BRI)
Brisbane Australia
AQ
Gynochtodes sessilis Halford
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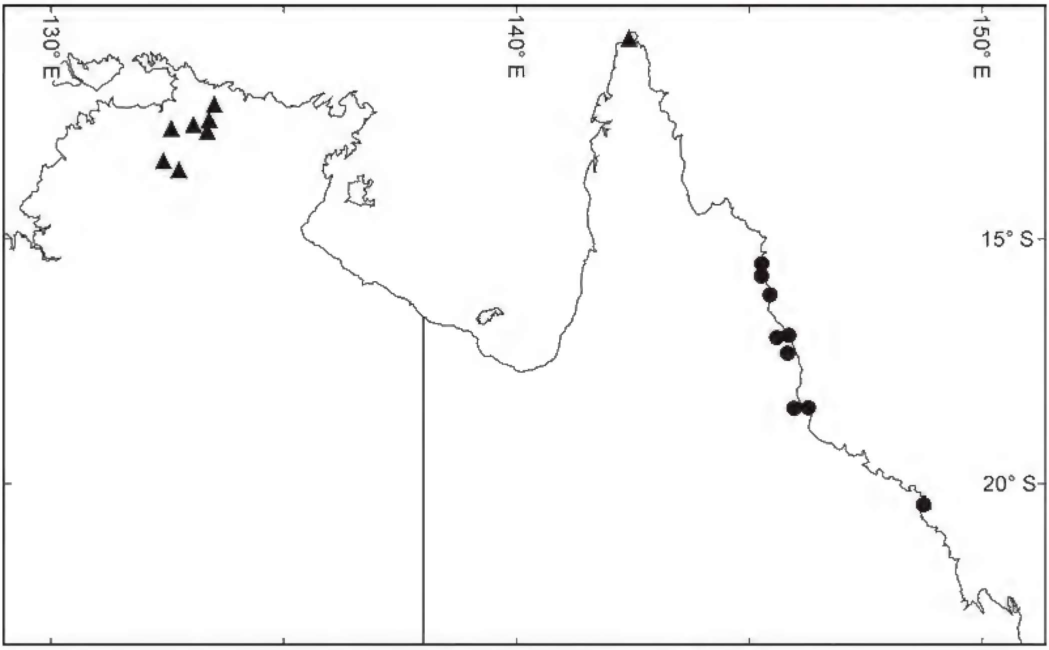
Figure 1. Photograph of holotype of ***Gynochtodes sessilis*** Halford.



Map 1. Distribution of *Gynochtodes australiensis* ▲ and *Gynochtodes sessilis* ●.

Acknowledgements

I would like to thank Les Pedley for the translation of the diagnosis into Latin and Gordon Guymer, Director of BRI, for making available working space and facilities at BRI.

References

Forster, P.I. & Halford, D.A. (2002). Rubiaceae. In R.J.F. Henderson (ed.), 'Names and Distribution of Queensland Plants, Algae and Lichens.' pp. 173–177. (Environmental Protection Agency: Brisbane).

Johansson, J.T. (1988). A new species of *Gynochtodes* (Rubiaceae, Rubioideae) from Australia. *Australian Systematic Botany* 1(4): 369–372.

Two new species of *Morinda* L. (Rubiaceae) from north east Queensland

D.A. Halford and A.J. Ford

Summary

Halford, D.A. & Ford, A.J. (2004). Two new species of *Morinda* L. (Rubiaceae) from north east Queensland. *Austrobaileya* 6(4): 895-902. *Morinda podistra* and *M. ammitia* are described, illustrated and diagnosed against related species. Notes on habitat and distribution are provided for each species.

Key words: *Morinda*, taxonomy, Australian flora, *Morinda podistra*, *Morinda ammitia*, Rubiaceae

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A.J. Ford, CSIRO, Sustainable Ecosystems and Rainforest CRC, Tropical Forest Research Centre, PO Box 780, Atherton, Queensland 4883, Australia

Introduction

The genus *Morinda* L. comprises approximately 80 species mostly in the Old World tropics (Mabberley 1997). Currently six named species of *Morinda* are recorded in Australia, namely *M. bracteata* var. *celebica* (Miq.) Valeton, *M. canthoides* (F.Muell.) Halford & R.J.F.Hend., *M. citrifolia* L., *M. jasminoides* A.Cunn. ex Benth., *M. reticulata* Benth. and *M. umbellata* L. In this paper we describe two new species endemic to north east Queensland.

Methods

The study is based upon the examination of herbarium material from BRI and QRS with field observations by the second author of both new species. The Herbarium acronyms follow Holmgren *et al.* (1990). All specimens cited have been seen by one or both authors.

Measurement of floral parts are based on material preserved in 70% ethanol or dried material reconstituted by placing in boiling water for a few minutes. The compound fruit formed by the fusion of a number of ovaries in species of *Morinda* as well as in some other genera of the tribe Morindeae has been described by the term syncarp by many authors (e.g. Johansson 1987, Robbrecht 1988, Johansson 1988). Igersheim and Robbrecht (1993) have pointed out that this is an inappropriate term and should be avoided. In this paper the term "compound syncarpous drupe" is used to describe the compound fruit. The term "drupe" is used here as defined by Clifford and Dettmann (2001).

Taxonomy

Morinda podistra Halford & A.J.Ford, **sp. nov.** *M. umbellatae* similis autem foliis maturis apice acuminato plus extenso praeditis et indumento pilis antrorsis in ramulosis, in pedunculis et in pagina inferiore folii vestita differt. **Typus:** Queensland. Cook District: Daintree River National Park, Black Mountain area, Daintree River headwaters, 25 May 1998, *P.I. Forster* PIF22959, *R. Jago, R. Jensen & R. Booth* (holo: BRI).

Morinda sp. (Mt Lewis L.W.Jessup+ GJM228), Forster and Halford (2002).

Twining vine, to 4m high, or rarely a scandent shrub. Stem and main branches slender, ± smooth to longitudinally striated, 3–6 mm diameter. Branchlets terete, scabrid, moderately dense to densely hairy, glabrescent; hairs simple, antrorse, ascending to spreading, up to 0.6 mm long. Leaves petiolate, opposite; stipules interpetiolar, sheathing, 1–5 mm long, truncate at apex, moderately dense to densely hairy with hairs as for branchlets; petioles 1–5 mm long; laminae ± chartaceous, narrowly obovate-elliptic or narrowly elliptic, 2.5–10 cm long, 0.7–3 cm wide; base attenuate; margins entire, slightly recurved (when dry); apex acuminate; adaxial surface usually glabrous and smooth or rarely with scattered, short, antrorse hairs and then scabrid; abaxial surfaces sparsely to moderately hairy especially along midvein

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and secondary veins, scabrous; hairs simple, antrorse, appressed to ascending, up to 0.9 mm long; venation brochidodromus with 4–8 lateral veins per side of midvein, slightly raised on adaxial surface, prominent on abaxial surface; midvein conspicuously raised on adaxial surface, prominent on abaxial surface; tuft-domatia present in lateral vein axils on abaxial surface. Flowers usually 4-merous (rarely 3 or 5-merous), bisexual or unisexual (?), sessile, in congested capitula, the flowers joined at least by the base of the gynoecium. Capitula pedunculate in terminal umbels with 2–4 (often 2) capitula per umbel, ± globose, 3–4 mm across (excluding corollas), 6–12 flowered, with colleters present between flowers; peduncles 2–10 (–15) mm long, moderately dense to densely hairy with hairs as for branchlets. Calyx tube green, 0.6–0.9 mm long, c. 1.5 mm across, glabrous to minutely and sparsely hairy abaxially and glabrous adaxially, truncate. Corolla valvate, deciduous, cream, turning creamy yellow with age, sparsely to densely hispidulous on abaxial surface with hairs up to 0.1 mm long; tube 1.3–2 mm long, the middle of the tube is fenestrated by short longitudinal slits, slightly widened at the apex, glabrous adaxially but densely hairy at mouth; hairs simple, up to 0.8 mm long; lobes spreading, ovate, 1.8–2.2 mm long, 1.1–1.7 mm wide, with a small subapical appendage on abaxial surface, sparsely to densely hairy adaxially, acute and ± cucullate at apex. Stamens exserted; filament 0.5–1 mm long, inserted c. 0.3 mm below the sinuses of the corolla lobes; anthers dorsifixed, linear-oblong, 1.0–1.3 mm long, dehiscing laterally. Disc entire, convex, c. 0.3 mm high, glabrous. Ovary 2-celled, biovulate, with false septum in the upper part appearing to divide each cell into 2; style c. 1 mm long, glabrous; stigma bifid, with erect lobes 0.3–0.8 mm long, adaxial surface papillate, abaxial surface with minute, scattered, antrorse hairs. Fruit a compound syncarpous drupe, orange when ripe, subglobose, 8–10 mm across, persistent calyx tubes prominent on surface, minutely and sparsely hairy; colleters enlarged and fleshy; mesocarp fleshy, containing several pyrenes; pyrenes ± ellipsoid, dorsiventrally compressed, 3–3.5 mm long, 2.5–3mm wide, c. 1.7 mm thick, 1-seeded; endocarp cartilagineous, brown, ± rugose, with basal marginal groove. Seeds irregularly shaped but usually 3-faced, c. 2.8 mm long, c. 1.7 mm wide, c. 1.2 mm thick; testa membraneous, dark brown; endosperm starchy and hard; embryo c. 1 mm long, straight; cotyledons very thin, about the same length as, but slightly wider than, the radicle. **Fig. 1.**

***Additional specimens examined*:** **Queensland.** Cook District. slopes of Mt Lewis, Feb 1932, *Brass* 2083 (BRI); Mt Lewis, a few km down from hut, Mt Lewis Forest Reserve, Jan 2002, *Cooper* WWC1659 & *Ford* (BRI); Mt Lewis Forest Reserve, 26 km along Mt Lewis road, near creek down from hut, Dec 2001, *Cooper* WWC1632 *et al.* (BRI, QRS); edge of Zarda Camp Clearing Upper Mossman River, Sep 1936, *Flecker* NQNC2331 (QRS); Mt Lewis FR, 1 km E of peak "1243", Dec 2002, *Ford* 3782 & *Holmes* (BRI); *ditto*, *Ford* 3784 & *Holmes* (BRI); summit of Devil's Thumb, Mossman Gorge NP, Apr 1986, *Godwin* C3091 (BRI); SFR 143, North Mary logging area, Dec 1977, *Gray* 828 (QRS); Mt Lewis, Sep 2002, *Halford* Q7400 & *Ford* (BRI); SFR 143, North Mary logging area, Dec 1974, *Hyland* 7909 (BRI, QRS); SFR 143, North Mary logging area, Nov 1974, *Hyland* 7887 (QRS); SFR 143, Nov 1974, *Irvine* 1066 (BRI, QRS); Mt Lewis Rd, S Mary logging area, 16 km NNW [of] Mt Molloy, Nov 1988, *Jessup* GJM1472 *et al.* (BRI); Mt Lewis Rd near Half Ton Creek crossing, about 30 km from Rex Highway, Nov 1988, *Jessup* GJM29 *et al.* (BRI); Mt Misery E of Mt Spurgeon, 15.4 km NNE [of] Mt Carbine, Nov 1988, *Jessup* GJM971 *et al.* (BRI); Mt Lewis Rd, 28 km from Mt Molloy – Mossman Rd, Jan 1981, *Jessup* 282 & *Clarkson* (BRI); Mt Lewis Rd boundary of Round logging area and Carbine logging area, 20 km NNW [of] Mt Molloy, Nov 1988, *Jessup* GJM288 *et al.* (BRI); Mossman Coast Range, Apr 1992, *Russell* 28 (BRI); Near Schillers Hut, Mt Spurgeon, Sep 1972, *Webb* & *Tracey* 11799 (BRI); Mt Lewis, Oct 1971, *Webb* & *Tracey* 10510 (BRI).

***Distribution and habitat*:** *Morinda podistra* is endemic to north east Queensland, where it is currently known from the Mt Lewis–Mt Spurgeon area, west of Mossman, on the Mount Carbine Tableland and the Main Coast Range (**Map 1**). It is recorded as growing in simple and complex notophyll vine forest, and simple microphyll vine-fern thicket communities on soils derived from granite substrates at altitudes of 1000 to 1330 m. *Morinda podistra* appears to be more common in the microphyll vine-fern thicket communities amongst granite boulders, which have a low and broken canopy, than in the notophyll vine forests. Common canopy trees include: *Sphalmium racemosum* (C.T.White) B.G.Briggs, B.Hyland & L.A.S.Johnson, *Syzygium endophloium* B.Hyland, *Garcinia brassii* C.T.White, *Flindersia pimenteliana* F.Muell. f. *pimenteliana*, *Niemeyera* sp. (Mt Lewis A.K.Irvine 1402), *Balanops australiana*

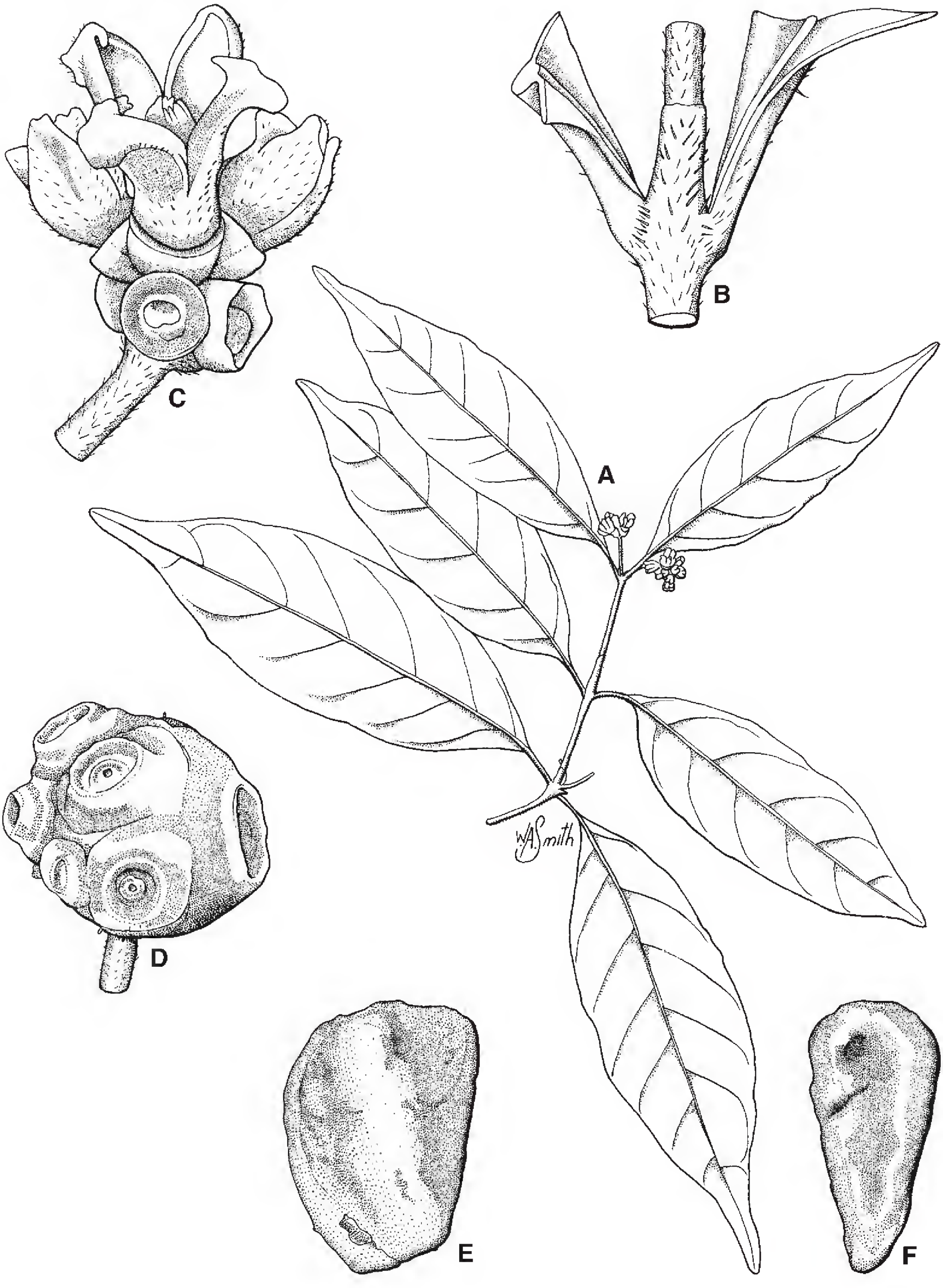

Fig. 1. ***Morinda podistra.*** A. branchlet with flowers × 1. B. branchlet node with stipules and leaf bases × 6. C. inflorescence × 8. D. compound fruit × 4. E. adaxial view of pyrene × 12. F. lateral view of pyrene × 12. A from *Ford* 3782 & *Holmes* (BRI); B from *Halford* Q7400 & *Ford* (BRI); C from *Ford* 3784 & *Holmes* (BRI); D-F from *Ford* 3871 & *Holmes* (BRI). Del. W. Smith.

F.Muell., *Halfordia kendack* (Montrouz.) Guillaumin and *Uromyrtus metrosideros* (F.M.Bailey) A.J.Scott. Common shrubs and understorey plants include: *Chionanthus axillaris* R.Br., *Mischocarpus pyriformis* subsp. *retusus* (Radlk.) R.W.Ham, *Alyxia orophila* Domin, *Agapetes meiniana* F.Muell. *Oraniopsis appendiculata* (F.M.Bailey) J.Dransf., A.K.Irvine & N.W.Uhl, *Rapanea* sp. (Zarda LA B.P.Hyland 6898) and *Lomandra hystrix* (R.Br.) L.R.Fraser & Vickery.

***Phenology*:** Flowers have been recorded from November to January whilst fruits have been recorded in April and May.

***Affinities*:** *Morinda podistra* resembles *M. umbellata*, but differs from that species by its mature leaves that have a longer drawn out acuminate apex and the antrorse hairs that are present on the branchlets, peduncles and abaxial leaf surface. *Morinda podistra* and *M. umbellata* are known to co-exist in the Mt Lewis area.

***Notes*:** *Morinda podistra* is commonly observed as growing on soil substrate. However, it has also been observed as a lithophyte, where it produces adventitious roots along the stem.

The new leaf growth of *M. podistra* is pale green. Expanding stipules, recently produced nodes, petioles, twigs and peduncles are usually purplish in colour. Flower bud colour has been recorded as being pinkish, or purplish at the base of the corolla.

The flowers from the collections *Ford* AF3784 (BRI), *Jessup* GJM228 *et al.* (BRI) and *Jessup* GJM971 *et al.* (BRI) are tentatively interpreted as being unisexual as they have pollen producing anthers but lack a style of any description, although the ovary is well developed with what appear to be functional ovules. The flowers from collections *Gray* 828 (QRS), *Cooper* WWC1632 *et al.* (BRI), *Jessup* GJM771 *et al.* (BRI), *Anon.* [AQ456135] (BRI) and *Irvine* 1066 (BRI) appear to be bisexual with a well developed style, stigma, ovary and pollen producing anthers. Further flowering material and field investigations are required to assess what reproductive strategies are present in this species.

***Conservation status*:** *Morinda podistra* has an apparently restricted and narrow distribution. However it is locally common within its habitat in this range. All of the cited specimens have been collected from within the World Heritage Area of the Wet Tropics bioregion. Also, a number of collections have been made in the Daintree National Park. It is not considered at risk at this time.

***Etymology*:** The specific epithet *podistra* is Greek meaning 'foot trap'. As intrepid bushwalkers will testify, the wiry stems of this species often form dense stands in which backpacks and feet get caught.

Morinda ammitia Halford & A.J.Ford, **sp. nov.** *M. bracteatae* var. *celebicae* nonnihil similis autem caulibus pubescentibus, foliis pubescentibus, fructibus pubescentibus (glabris in *M. bracetata* var. *celebica*), corollae tubis brevioribus (1.5–3.5 mm vice c. 10 mm in *M. bracteata* var. *celebica*), habitu scandenti (habitu fruticis usque arboris parvae in *M. bracteata* var. *celebica*) et lobis calycis foliaceis carentibus differt. **Typus:** Queensland. Cook District: Cooktown – Isabella Road, c. 200 m E of Isabella Falls, 13 March 2001, *A. Ford* AF2697 & *J. Holmes* (holo: BRI; iso: DNA, NSW distribuendi).

Morinda sp. (Altanmoui Range B.P.Hyland 6323), Forster and Halford (2002).

Vine or scandent shrub with long arching, non-twining, stems. Stem and main branches not seen. Branchlets ± quadrangular when young becoming ± terete and striated with age, moderately dense to densely hairy; hairs simple, ascending to spreading, 0.1–0.7 mm long. Leaves petiolate, opposite; stipules interpetiolar, sheathing, 1–2 mm long, produced into a narrow triangular lobe up to 2 mm long, hairs as for branchlets; petioles 2–5 mm long; laminae ± coriaceous, narrowly obovate-elliptic, narrowly elliptic to elliptic, 4.5–9 cm long, 2.5–5.6 cm wide; base cuneate; margins entire, slightly recurved; apex obtuse to rounded, acute or sometimes shortly acuminate; adaxial and abaxial surfaces glabrous, scabrid or sparsely to moderately hirtellous, indumentum usually slightly denser on abaxial surface; hairs simple, spreading to ascending, up to 0.8 mm long; venation brochidodromus with 5–10 lateral veins per side of midvein, slightly raised on adaxial surface, prominent on abaxial surface; midvein slightly raised on adaxial surface, prominent on abaxial surface; tuft-domatia present in lateral vein axils on abaxial surface. Flowers 4 or 5-merous, bisexual or unisexual (?), sessile, in congested capitula, the flowers joined at least by the base of the gynoecium. Capitula pedunculate in terminal umbels with 2–4 capitula per umbel or solitary in upper leaf axils, rarely a solitary sessile flower or a rudimentary capitulum present at base of peduncles, ± globose, 8–12 mm across (excluding corollas), 12–30-flowered with colleters absent between flowers; peduncles 10–23 mm long, (elongating to 30 mm in fruit), terete, often striated, moderately dense to densely hairy with hairs as for branchlets. Calyx tube yellow-green, c. 2 mm long, c. 2.5 mm across, moderately to densely hispidulous adaxially with simple hairs up to 0.2 mm long, densely hairy abaxially with appressed to spreading simple hairs up to 0.3 mm long, truncate, undulate or irregularly and shallowly toothed. Corolla valvate, deciduous, greenish cream to white, hispidulous on abaxial surface; tube 1.5–3.5 mm long, the middle of the tube is fenestrated by short longitudinal slits, slightly widened at the apex, glabrous adaxially but densely hairy towards mouth; hairs simple, up to 1 mm long; lobes spreading and recurved distally, narrowly triangular to triangular, 3–4 mm long, 1.5–2 mm wide, acute and ± cucullate at apex, sparsely to densely hairy adaxially, glabrous towards apex. Stamens exserted; filament 0.5–1.7 mm long, inserted c. 0.5 mm below the sinuses of the corolla lobes; anthers, dorsifixed, linear-oblong, 1.3–2 mm long, minutely hairy, dehiscing laterally. Disc entire, flat, c. 0.5 mm high, sparsely covered with minute simple hairs. Ovary 2-celled, biovulate, with false septum in the upper part appearing to divide each cell into 2; style 0.8–1.5 mm long, included in corolla tube, glabrous; stigma bifid, with erect lobes c.1.5 mm long, adaxial surface papillate, abaxial surface glabrous. Fruit a compound syncarpous drupe, black when ripe, subglobose, 20–30 mm across, hispidulous, persistent calyx tubes prominent on surface, mesocarp fleshy, containing several pyrenes; pyrenes ± ellipsoid or obovoid, dorsiventrally compressed, 5–6 mm long, 2.5–4mm wide, 1.8–2.2 mm thick, 1-seeded; endocarp cartilagineous, pale brown, ± smooth, with basal marginal groove. Seeds c. 4 mm long, c. 2 mm wide, c. 1.6 mm thick; testa membraneous, dark brown; endosperm corneous, ± white; embryo (most seeds lacking an embryo) c. 2mm long, straight, surrounded by a sticky and gelatinous membrane; cotyledons thin, shorter than but slightly wider than the radicle. **Fig. 2.**

Additional specimens examined**: Queensland.** COOK DISTRICT. Turtle Rock, 12 km SSE of Laura, Nov 1991, *Bean* 3803 (BRI); Isabella Creek, about 27 miles [c. 43 km] NW of Cooktown, Jun 1968, *Brass* 33836 (QRS); Laura sandstone area N of Laura River near Early Man site, May 1975, *Byrnes* 3312 (BRI); Split Rock Gallery, 14 km S of Laura on the Peninsula Development Rd, Oct 1984, *Clarkson* 5635A (BRI, QRS); Cape Melville NP, Altanmoui Range section, 7 km SE of Wakooka Outstation, Oct 1992, *Fell* DGF2703 & *Stanton* (BRI, QRS); Split Rock Gallery, 14 km S of Laura on the Peninsula Development Rd, Jul 1994, *Gray* 5764 (QRS); Isabella – McIvor road, 200 m from Isabella Falls, NW of Cooktown, Nov 2002, *Ford* 3719 & *Holmes* (BRI); Gugu Yalangi (Laura), Sep 1976, *Hyland* 9041 (BRI, QRS); Altanmoui, Jul 1972, *Hyland* 6323 (BRI, QRS); Cape Melville, Sep 1970, *Hyland* 4660 (BRI); 16 km SE of Laura, Jun 1976, *Jackes* [AQ168531] (BRI); between Battle Camp and Isabella Ck on Laura Station – Cooktown Rd, Nov 1979, *Webb & Tracey* 13411 (BRI, QRS); 9 miles [c. 14 km] S of Laura on main Mareeba – Coen Rd, Oct 1969, *Webb & Tracey* 9917A (BRI); Laura Galleries, a few km S of Laura on Mareeba – Coen Rd, Nov 1979, *Webb & Tracey* 13395 (BRI); Kennedy River, Aug 1966, *Volck* AFO3303 (QRS).

Distribution and habitat**:** *Morinda ammitia* is endemic to north east Queensland, where it is known from Cape Melville to the Cooktown – Laura area (**Map 1**). It is recorded as growing in open forest and low woodland communities, at the base of sandstone cliffs, in deciduous vine thicket, in low open eucalypt woodland and heath-like communities on sandstone escarpments. Associated dominant trees include: *Corymbia hylandii* (D.J.Carr & S.G.M.Carr) K.D.Hill & L.A.S.Johnson, *Eucalyptus phoenicea* F.Muell., *Eucalyptus crebra* F.Muell. and *Blepharocarya involucrigera* F.Muell. Large shrubs include: *Acacia flavescens* A.Cunn. ex Benth., *Parinari nonda* F.Muell. ex Benth. and *Erythrophleum chlorostachys* (F.Muell.) Baill. Small shrubs include: *Alyxia spicata* R.Br., *Hibbertia banksii* (R.Br. ex DC.) Benth. and *Phyllanthus/Sauropus* spp. Conspicuous understorey genera include: *Xanthorrhoea*, *Pandanus* and *Heteropogon*.

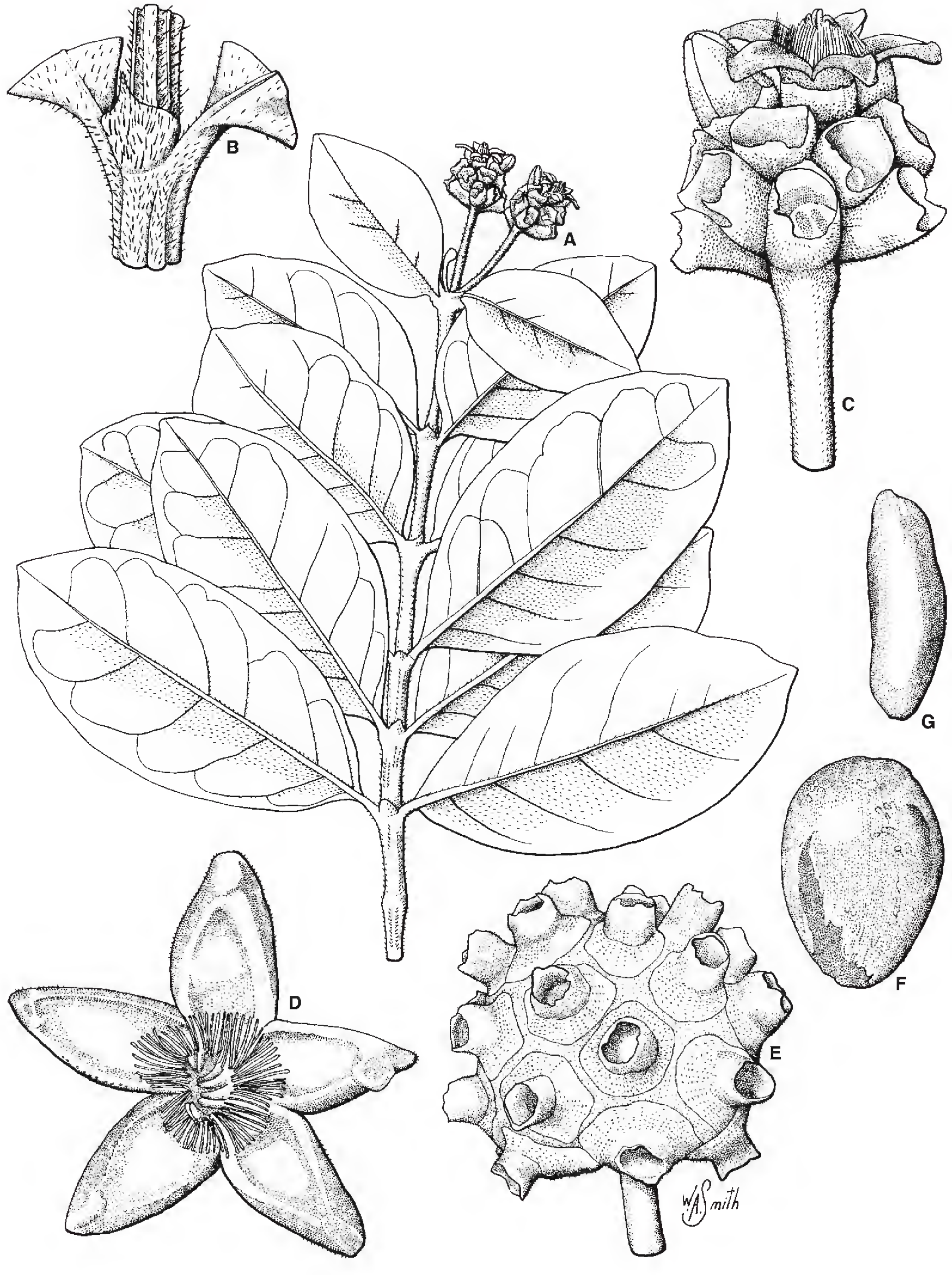

Fig. 2. ***Morinda ammitia***. A. branchlet with flowers × 0.8. B. branchlet node with stipules and leaf bases × 4. C. inflorescence × 6. D. flower viewed from above × 8. E. compound fruit × 2. F. adaxial view of pyrene × 6. G. lateral view of pyrene × 6. A-D from *Ford* 3719 & *Holmes* (BRI); E-G from *Ford* AF2697 & *Holmes* (BRI). Del. W. Smith.

Phenology**:** Flowers have been recorded from June to December, whilst fruits have been recorded in March, May and July.

Affinities**:** *Morinda ammitia* is somewhat similar to *M. bracteata* var. *celebica* but differs from that species in its hairy stems, leaves and fruits; (glabrous for *M. bracteata* var. *celebica*); shorter corolla tubes (1.5–3.5 mm long compared with c. 10 mm long for *M. bracteata* var. *celebica*); scandent habit (shrub to small tree for *M. bracteata* var. *celebica*); and the lack of foliaceous calyx lobes.

Notes**:** Flower buds have been recorded as having yellowish corolla lobes. The flowers from collections *Hyland* 6323 (QRS), *Clarkson* 5635A (BRI), *Bean* 3803 (BRI) and *Fell & Stanton* DGF2703 are tentatively interpreted as being unisexual as they have pollen producing anthers but lack a style of any description, although the ovary is well developed with what appear to be functional ovules. The summit of the ovary has an orifice, as does the bisexual flower after the style has shed. The flowers from collections *Ford* 3719 (BRI, QRS) and *Ford* 3720 (BRI, QRS) appear to be bisexual with a well developed style, stigma, ovary and pollen producing anthers. Further flowering material and field investigations are required to assess what reproductive strategies are present in this species.

Conservation status**:** *Morinda ammitia* is assessed as data deficient. Three collections have been made from Cape Melville National Park while other collections are from populations outside of conservation reserves.

Etymology**:** The specific epithet is from the Greek *ammites*, sandstone; in reference to the species occurrence on sandstone substrates.

Acknowledgements

The authors wish to thank Will Smith for the illustrations, Peter Bostock for the maps, Les Pedley for the translation of the diagnoses into Latin and suggestions regarding the specific epithet "*ammitia*". The first author would like to thank Gordon Guymer, Director of BRI, for making available working space and facilities at BRI. Permits to traverse and collect in the Mount Lewis Forest Reserve were issued by the Queensland Parks and Wildlife Service. Jenny Holmes (Atherton) provided invaluable field assistance.

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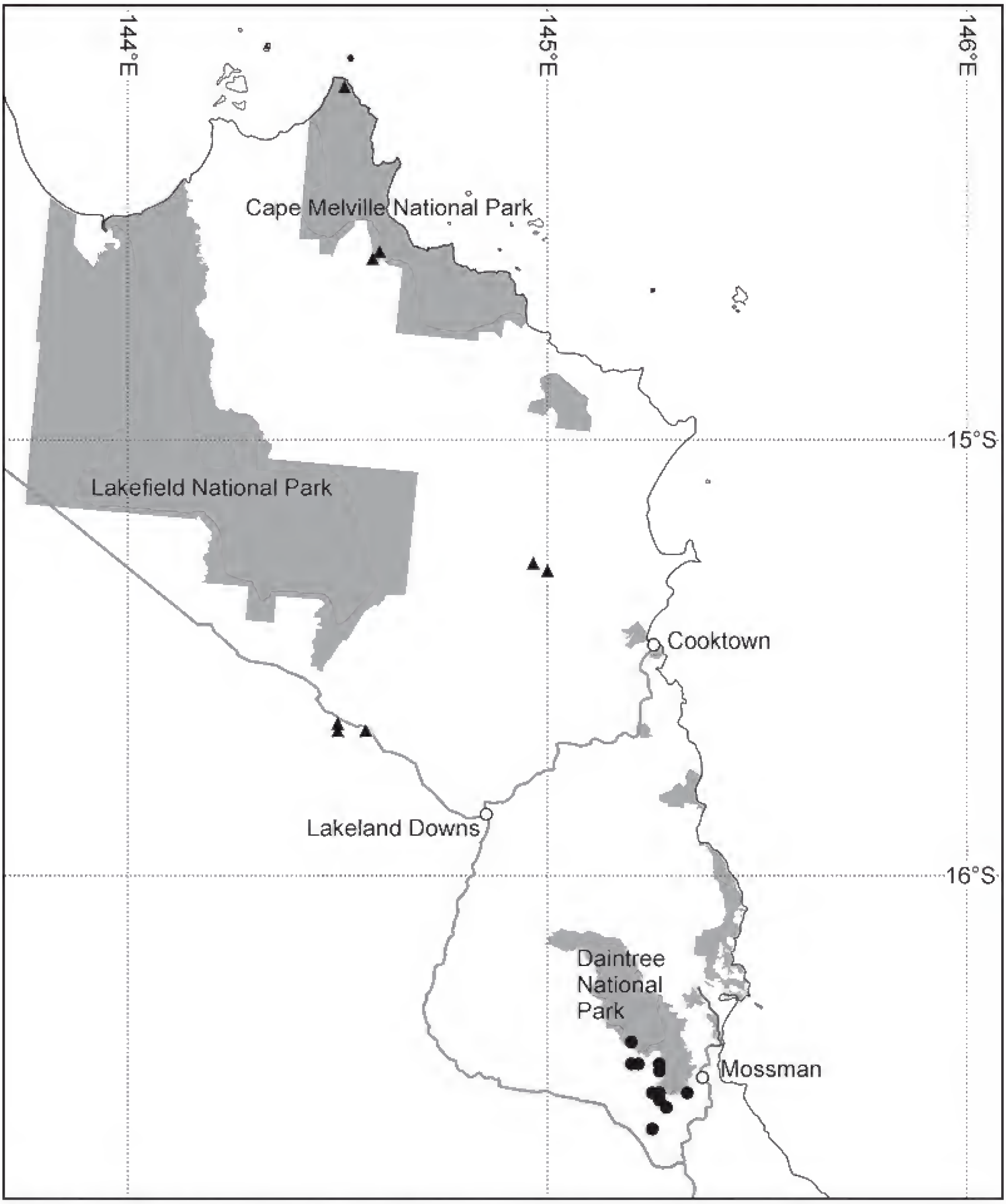
144°E
145°E
146°E
15°S
16°S
Cape Melville National Park
Lakefield National Park
Cooktown
Lakeland Downs
Daintree National Park
Mossman

Map 1. Distribution of *Morinda podistra* ● and *Morinda ammitia* ▲ .

The tribe *Coffeeae* DC. (Rubiaceae: Ixoroideae) in Australia

Paul I. Forster

Summary

Forster, P.I. (2004). The tribe *Coffeeae* DC. (Rubiaceae: Ixoroideae) in Australia. *Austrobaileya* 6 (4): 903–909. Two genera in the tribe Coffeeae occur in Australia, namely *Coffea* L. (with the naturalised species *C. arabica* L. and the doubtfully naturalised *C. liberica* Hiern.) and *Psilanthus* Hook.f. (with the single non-endemic species *P. brassii* (J.-F.Leroy) A.P.Davis). A key to genera is provided, together with an amplified description and illustration for *Psilanthus brassii.*

Keywords: *Coffea, Psilanthus – Australia*

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Introduction

This paper provides an overview of the Tribe Coffeeae (Rubiaceae: Ixoroideae) as it occurs in Australia. The tribal classification within the Rubiaceae was reviewed by Robbrecht & Puff (1986) and summarised by Robbrecht (1988) wherein a narrow circumscription for the tribe Coffeeae DC. was proposed with only two genera included, namely *Coffea* L. and *Psilanthus* Hook.f. These two genera are closely allied and are distinguished primarily on growth habit (evergreen or deciduous) and floral features (e.g. length of corolla tube, style and stamen exsertion), all characters that might be logically accommodated in a single genus. Limited (as to the number of taxa sampled) molecular work (chloroplast DNA) on *Psilanthus* does tend to indicate that this genus is discrete from *Coffea*, as the two species of *Psilanthus* sampled clustered as an outgroup to twenty-three taxa of *Coffea* (Cros *et al.* 1998). Extremely limited hybridization work between single species from the two genera (*Coffea arabica* L. and *Psilanthus ebracteolatus* Hiern) (Couturon *et al.*1998) found few barriers to intergeneric gene transfer and these authors considered recognition of two genera was not warranted. Until further evidence is presented on the monophyly or otherwise of the genera in the Coffeeae, the status quo is maintained here.

The genus *Coffea* has about 90 species that are native to Africa, Madagascar and the Mascarenes (Bridson 1988), with a couple of species widely cultivated in the tropics for coffee. A single species of *Coffea* (*C. arabica* L.) is naturalised in Queensland (Halford & Reynolds 1994; Reynolds & Halford 1997; Forster & Halford 2002) and on Lord Howe and Norfolk Islands (Green 1994), although no detail has been provided to date on the Queensland naturalisations. A second species of *Coffea, C. liberica* Hiern. has been recorded from a single locality near Cape Tribulation; but is not considered fully naturalised, particularly as efforts have been made to eradicate it from the site.

The genus *Psilanthus* Hook.f. was newly recorded for Queensland, Australia by Bridson (1987) with a note that *Paracoffea brassii* J.-F.Leroy occurred in the Torres Strait, however, no combination was made in *Psilanthus* at that time. Davis (2003) has recently made the new combination *P. brassii* (J.-F.Leroy) A.P.Davis and recorded the species for Australia on the basis of several collections from Queensland (*Cunningham* 7 (K) and *Wannan* [1818] NSW443387 (NSW)). Davis (2003) recorded *Psilanthus brassii* from Central Province in Papua New Guinea and from Australia ("Torres Strait Island and Queensland"). He treated the Torres Strait Islands as being a separate political entity to the state of Queensland, which they are not, and the few specimens that he cited would indicate that the species only occurs in the Torres Strait and tip of Cape York in Queensland. Davis did not consult collections at the Queensland Herbarium (BRI), the major repository of material from Queensland, otherwise the known distribution of this species may have been better documented by him.

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Apart from the original publication of *Paracoffea brassii* J.-F.Leroy (basionym for *Psilanthus brassii*) where there is a description in French (Leroy 1968), there is no description of this plant in English that includes coverage of the flowers, nor have the flowers been illustrated, hence these deficiencies are remedied in the current paper. The genus *Psilanthus* has about twenty-one species that are found in tropical Africa, India and Malesia (Bridson 1987; Sivarajan *et al.*1992) as well as the single species in Australia and New Guinea.

Taxonomy

Coffeeae DC., Ann. Mus. Hist. Nat. 9: 217 (1807), emend Robbrecht & Puff (1986). **Type:** *Coffea* L.

Refer to Robbrecht & Puff (1986), Robbrecht (1988) and Bridson (1988) for a tribal description.

Key to genera in Australia

Evergreen shrubs; corolla-tube ± same length as lobes; style and anther fully exserted . . . . **Coffea**

Deciduous shrubs; corolla tube longer than lobes; style and anthers included (anthers may be part exserted) . . . . **Psilanthus**

Coffea L., Sp. Pl. 172 (1753). **Type:** *C. arabica* L.

Refer to Bridson (1988) for a generic description.

Key to the Naturalised (or Doubtfully Naturalised) species of *Coffea* in Australia (N.B. these characters may not work for material of these species outside of this region)

Leaf lamina elliptic; flowers 5-merous . . . . **C. arabica**

Leaf lamina obovate; flowers 6-merous . . . . **C. liberica**

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1. Coffea arabica L., Sp. Pl. 172 (1753).

Type: cultivated in Holland, *Hort. Clifford* (holo: BM).

Refer to Bridson (1988) or Green (1994) for a species description.

***Specimens examined*: Queensland.** COOK DISTRICT: Curtain Fig site, SW of Yungaburra, 17° 17'S, 145° 34'E, May 2000, *Bean* 16559 (BRI); Daintree, Sep 1937, *Brass* 176 (BRI; CANB, L, MO *n.v.*); Peeramon Scrub, 4 km NE of Malanda, 17° 18'S, 145° 37'E, Oct 2000, *Forster* PIF26330 *et al.* (A, AD, BRI, K, MEL); Topaz, Towalla road, 17° 28'S, 145° 43'E, Oct 2001, *Forster* PIF27610 *et al.* (BRI, MEL, NSW); Lake Eacham N.P., S end of Picnic area, 17° 15, 145° 35'E, May 1985, *Melville* S15 (BRI); Rocky Creek, Atherton – Mareeba road, 17° 12'S, 145° 27'E, Sep 1959, *Smith* 10795 (BRI); Prior's Creek, Atherton, 17° 15'S, 145° 25'E, Oct 1992, *Swarbrick* 10551 (BRI); Kuranda, 16° 49'S, 145° 38'E, Nov 1992, *Swarbrick* 10621 (BRI). MORETON DISTRICT: Brisbane River, Long Pocket, Indooroopilly, 27° 31'S, 152° 59'E, Aug 2000, *Batianoff* 200828 (BRI, NSW); Property of D.Cunnington, Gwynore Crescent, Buderim, 26° 41'S, 153° 04'E, Aug 1995, *Bean* 8871 (BRI, MEL); Off Paynter Creek road, c. 1.5 mile E of Nambour, 26° 38'S, 153° 00'E, May 1977, *Elsol* 111 (BRI); Buderim Mt., Fountain road, 26° 45'S, 153° 05'E, Jul 1989, *Nielsen* [AQ456714] (BRI). **New South Wales.** LORD HOWE ISLAND. Stevens Reserve, 31° 31'S, 159° 03'E, Jan 2001, *Le Cussan* 1102 (BRI; ex NSW). NORFOLK ISLAND. Louis Evan's Market Garden, Duncombe Bay, 29° 00'S, 167° 55'E, Oct 1999, *Waterhouse* BMW5528 (BRI). **Map 1.**

***Distribution and habitat*:** *Coffea arabica* (Arabian Coffee) is slowly naturalising in a number of localities in the 'Wet Tropics' of north-eastern Queensland, and around habitation in the south-eastern corner of the state (**Map 1**). The origins of these multiple naturalisations in Queensland are undoubtedly from cultivated plants, particularly in the 'Wet Tropics' around the Atherton Tableland, and near Buderim in the south-east. There are also localised naturalisations on both Lord Howe and Norfolk Islands (Green 1994). Arabian Coffee has been grown occasionally as a commercial crop or garden plant in these areas and is commonly encountered in gardens. Naturalised colonies of coffee have been recorded from the margins of rainforest, adjacent to old gardens or in disturbed situations where there is considerable shrubby undergrowth. It is presumed that bird mediated dispersal of *Coffea arabica* fruit is occurring, but no direct observations are known. At this stage, *Coffea arabica* is lowly ranked in terms of its invasiveness potential (ranked 189/200 by Batianoff & Butler 2002) and is not considered a high priority invasive weed (Batianoff & Butler 2003).

***Notes*:** Material of *Coffea arabica* from elsewhere, particularly within its natural distribution range, has a broader range of leaf lamina shape and floral part diversity than indicated in the above key (Bridson 1988).

2. Coffea liberica Hiern., Trans. Linn. Soc. Bot, sér. 2, 1: 171, t. 24 (1876).

Type: Sierra Leone, cultivated on Mr Effenhausen's farm, *Daniell s.n.* (lecto: BM, fide Bridson (1985: 806).

Refer to Bridson (1988) for a species description.

***Specimens examined*: Queensland.** COOK DISTRICT: Cooper Creek, Cape Tribulation road, 16° 11'S, 145° 25'E, Oct 1998, *Gray* 7392 (BRI). **Map 2.**

***Distribution and habitat*:** *Coffea liberica* is doubtfully naturalised at Cooper Creek in the 'Wet Tropics' of Queensland (**Map 2**) where it has been recorded in lowland complex mesophyll vineforest on substrates derived from metamorphics.

***Notes*:** The material from Cooper Creek appears to fall within the variation ascribed to *Coffea liberica* var. *liberica, viz.* corolla 6–9-merous, tube distinctly widened at the throat, lobes usually 5–10 mm wide (Bridson 1988).

It is likely that this species may continue to pose a problem as a naturalised plant in the Cape Tribulation area unless follow-up eradication procedures are employed.

Psilanthus Hook.f., Gen. Pl. 2: 115 (1873).

Refer to Bridson (1988) for a generic description.

A genus of c. 22 species. One non-endemic species in Australia (Queensland).

Psilanthus brassii (J.-F.Leroy) A.P.Davis, Novon 13: 183 (2003).

Paracoffea brassii J.-F.Leroy, J. Agric. Trop. Bot. Appl. 14: 598 (1967).

Type: Papua New Guinea. CENTRAL PROVINCE: Baroka, Nakeo district, 8 April 1933, *L.J. Brass* 3743 (holo: BO *n.v.*; iso: A *n.v.*; BRI).

[*Randia* sp. (Coen B.P.Hyland 13278) (Reynolds & Halford 1997)]

***Illustration*:** Leroy (1968: 599).

Shrub to 3 m high, deciduous. Indumentum absent or of simple, uniseriate trichomes. Leaf bearing stems slender, covered with thin reddish-brown bark, glabrous or with scattered to sparse trichomes. Stipules truncate to irregularly triangular, basal tubular portion 0.8–1.5 mm long, free apiculate portion 1.8–4 mm long. Leaves petiolate; petioles 4–5 mm long; lamina elliptic to obovate, 25–95 mm long, 12–60 mm wide, thin, papery, discolorous and drying grey-green, glabrous or with scattered to sparse indumentum abaxially on midrib and some lateral veins; domatia absent or present abaxially as small tufts of indumentum in angle between midrib and lateral veins; midrib and some lateral veins whitish on abaxial surface; tip acute to short acuminate; base cuneate. Flowers solitary and terminal on stems, sometimes on a short shoot to 5 mm long; flowers pedicellate for 1.5–2 mm, immediately subtended by short bracteoles, that are ± truncate, 0.4–1 mm long, then subtended (or not) by a leaf pair (shed in fruit), finally subtended by 4 bracts (shed in fruit) that are lanceolate, 3–5.8 mm long and 0.8–1.2 mm wide. Calyx tube 1.8–3 mm long, c. 1 mm diameter, bearing 4 or 5 unequal lobes that are shortly acute, 0.3–0.5 mm long. Corolla glabrous; tube 16–18 mm long, 2.8–3 mm wide at top, 1.2–1.6 mm wide at base; lobes acute, 10–13 mm long, 4.5–6 mm wide, attached 14–15 mm from base. Stamens 5; anthers attached near apex of tube with only the tips exserted, 6–6.5 mm long, c. 0.6 mm wide. Style c. 5 mm long; stigma lanceolate, c. 2.5 mm long, positioned 5–6 mm below the anthers. Fruit bilobed (rarely trilobed), soft-fleshy, 7–8 mm long, 7.5–8 mm wide, black to plum coloured; seeds 2 (3) per fruit, oblong-ellipsoid, c. 6 mm long and 5 mm wide, fawn, distinctly grooved on adaxial face. **Fig. 1.**

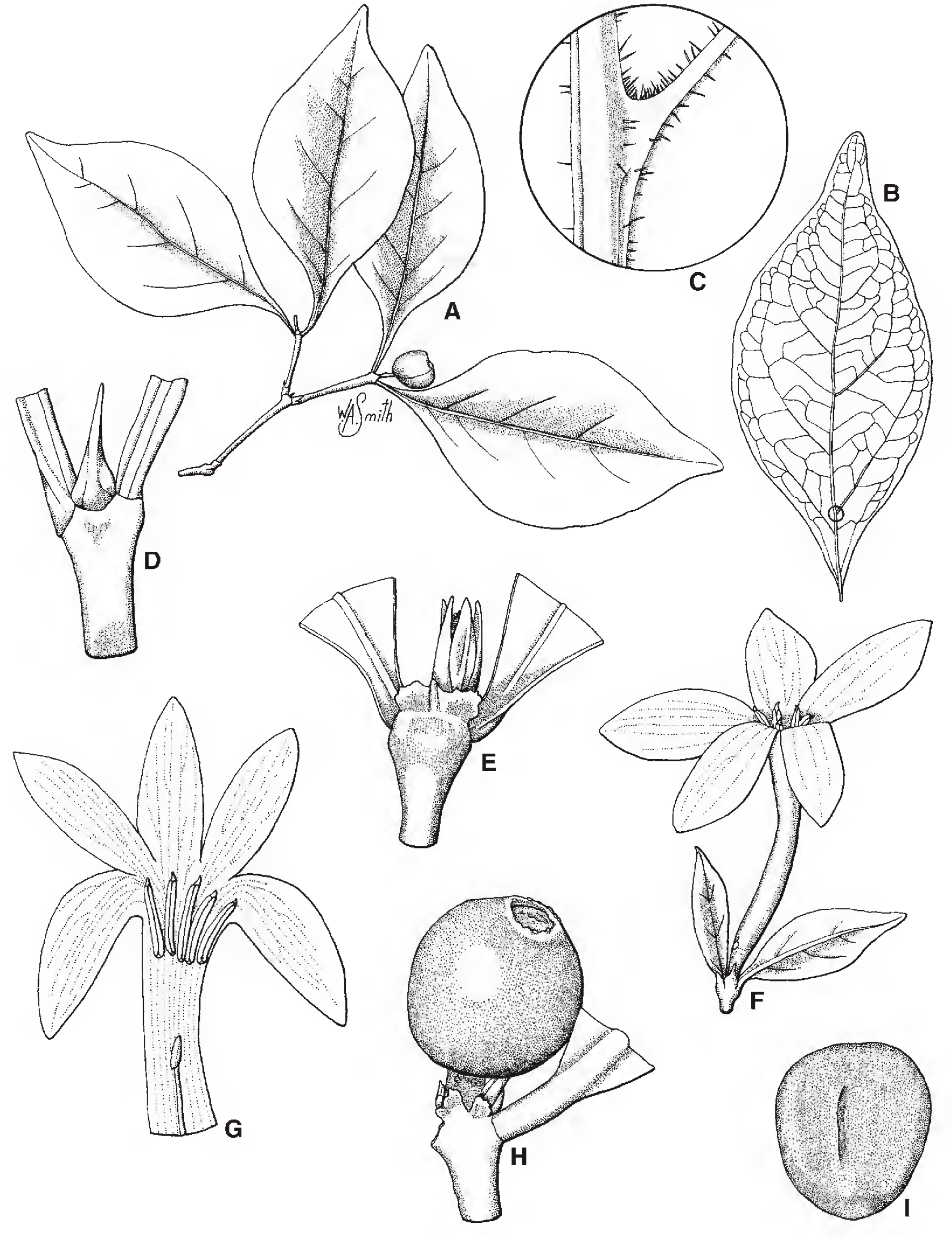

Fig. 1. ***Psilanthus brassii***. A. branchlet with fruit. × 0.8. B. undersurface of leaf showing venation. × 1. C. indumentum on undersurface of leaf (area indicated in circle in B) with domatium in angle between vein and midrib. × 16. D. node with stipule. × 8. E. node with inflorescence bearing four bracts. × 4. F. inflorescence with leaf pair and flower. × 4. G. dissected corolla with stamens and pistil. × 4. H. node with fruiting inflorescence. × 3. I. seed showing groove on adaxial face. × 4. A & D from *Fell* DGF2919 (BRI); B, C, H, I from *Forster* PIF19452 (BRI); F & G from *Wannan* 1418 (BRI); E from *Puttock & King* UNSW16901 (BRI). Del. W.Smith.

Specimens examined**: Papua New Guinea.** Central Province: Tovobada Hills, 12 miles [20 km] N of Port Moresby, May 1965, *Heyligers* 1199 (BRI; CANB, L, LAE *n.v.*); Near SE side of Little Mt Lawes, c. 16 miles [26.7 km] N of Port Moresby, Apr 1967, *Pullen* 6814 (BRI; A, CANB, K, L, LAE *n.v.*); Tovobada Hills, c. 9 miles [15 km] NNW of Port Moresby, May 1965, *Pullen* 6980 (BRI; A, BO, CANB, K, L, LAE, US *n.v.*). **Australia.** Cook District: 10.8 km S of Batavia Downs on the Peninsula Development road, 12° 45'S, 142° 43'E, Apr 1990, *Clarkson* 8463 & *Neldner* (BRI, L, MBA); Jane Table Hill, Lakefield N.P., 46.6 km N of Lakefield Homestead, 14° 30'S, 144° 07'E, Mar 1993, *Fell* DGF2919 & *Stanton* (BRI, MEL); Cape Melville N.P., Altanmoui Range section, 1.6 km E of Flat Hill, 62.6 km NE of Lakefield Homestead, 14° 30'S, 144° 35'E, May 1993, *Fell* DGF3215 & *Stanton* (BRI); Altanmoui Range, Cape Melville N.P., 1.6 km E of Flat Hill, 62.6 km NE of Lakefield Ranger Base, 14° 30'S, 144° 35'E, May 1994, *Fell* DGF4350 & *McDonald* (BRI); Equina Scrub, 42.4 km W of Coen, Holroyd Pastoral Holding, 13° 59'S, 142° 48'E, Jun 1994, *Fell* DGF4397 & *Buck* (BRI); Round Mountain, Embley Range, 13° 33'S, 143° 30'E, Jun 1992, *Forster* PIF10467 & *Tucker* (BRI); Klondyke, Station Creek track, McIlwraith Range, 14° 00'S, 143° 19'E, Jun 1996, *Forster* PIF19452 (BRI); Gore Island, Great Barrier Reef, 11° 59'S, 143° 14'E, Apr 1995, *Gray* 6125 (BRI; ex QRS); T.R. 14, Parish of Kesteven, 13° 42'S, 143° 18'E, Nov 1991, *Hyland* 14378 (BRI; ex QRS); Restoration Island, 12° 36'S, 143° 26'E, Apr 1995, *Le Cussan* 286 (BRI); Haggerstone Island, 12° 03'S, 143° 18'E, May 1995, *Le Cussan* 339 (BRI); Portland Roads, c. 0.5 km S of headland, 12° 36'S, 143° 24'E, *Puttock & King* UNSW16901 (BRI); 1 km S of Seisia, 10° 51'S, 142° 21'E, Nov 1999, *Wannan* 1418 (BRI, NSW).

Distribution and habitat**:** *Psilanthus brassii* has been recorded from Central Province of Papua New Guinea (in the vicinity of Port Moresby) and from the Cook District of Queensland with a northern occurrence on islands in Torres Strait and a southern limit at Altanmoui Range, Cape Melville (**Map 2**). Plants grow in "monsoon" forest (semi-deciduous microphyll to notophyll vineforest) on substrates derived from stabilised sand-dunes, laterite, sandstone or metamorphics at altitudes from near sea level to 300 m.

Notes**:** The identity of this species was first debated by Merrill & Perry (1945) who referred collections from Papua New Guinea (*Brass* 3743; *Carr* 11220 & 12389) and the Torres Strait (Sunday Island) (*Cunningham* 7) to *Coffea* (*Lachnostoma*) with a ? Nearly 60 years on and with the addition of the collection by *Wannan*, Davis (2003) finally classified this species in *Psilanthus*. This delay in identification has undoubtedly been influenced by the lack of flowering material (only *Hyland* 14378 and *Wannan* 1418 have flowers). The deciduous habit of *Psilanthus brassii* means that the plant is probably leafless between the months of September and November. Flowering commences with the onset of storm rain in November and December just prior to, or as the plants produce new leaves after the end of the 'dry' season. Fruits have been collected between March and June and are borne on plants where the leaves are fully expanded and hardened. This pattern of floral and fruiting behaviour is not unusual and is repeated in a wide range of plant species from diverse families that grow in the so-called 'wet – dry' tropics. Good examples of species with this phenological behaviour are *Croton simulans* P.I.Forst. (Euphorbiaceae) (Forster 2003), *Drypetes deplanchei* (Brongn. & Gris) Merr. (Euphorbiaceae) (Forster 1997), *Gyrocarpus americanus* Jacq. (Hernandiaceae), *Mallotus surculosus* P.I.Forst. (Euphorbiaceae) (Forster 1999) and *Turraea pubescens* Hellen. (Meliaceae). Nevertheless this phenological behaviour can make identification of this Rubiaceous plant difficult when it is leafless or with only immature leaves.

Davis (2003) noted that *Psilanthus brassii* was similar to *P. mabesae* (Elmer) J.-F.Leroy from the Philippines but differed in the "leaves, flowers (corolla), and fruits... glabrous (not puberulous to pubescent as in *P. mabesae*)". With the greater amount of material of *Psilanthus brassii* now available, these distinctions are not strictly correct. Although the flowers (corolla) and fruits of *P. brassii* are glabrous, not all collections have glabrous foliage. The collections *Fell* DGF4397, *Forster* PIF19452, *Le Cussan* 266 & 399, have from between a few scattered hairs on the leaf midrib below, to being sparsely hairy on the leaf undersurface and young shoot tips. While most collections lack leaf domatia, those that are pubescent to some degree also have occasional small domatia formed in the angle between the midrib and a lateral vein.

There is some slight variation in the arrangement of bracts and bracteoles in the inflorescence of this species. In its simplest form, the terminal inflorescence is subtended by two small bracteoles (retained in the fruit) that are in turn subtended by four linear-lanceolate bracts that are caducous. In its most complex form, the terminal inflorescence is once again subtended by the two small bracteoles (retained in the fruit), that are subtended by the four linear-lanceolate bracts, then further subtended by a pair of true leaves, the stipular pair, then a short shoot, followed by the four linear-lanceolate bracts and a pair of stipules again. Whether the most complex form has been derived from an inflorescence that has flowered and then produced a new shoot terminally, followed by yet another inflorescence is unknown without actual observation of live plants.

***Conservation status*:** *Psilanthus brassii* is widespread on Cape York Peninsula and some islands in Torres Strait. It has been recorded from Cape Melville and Lakefield National Parks. Davis (2003) listed it as of **Least Concern**; however, this was based on limited information about its distribution or perceived threats. It is not considered rare or threatened at present.

Acknowledgements

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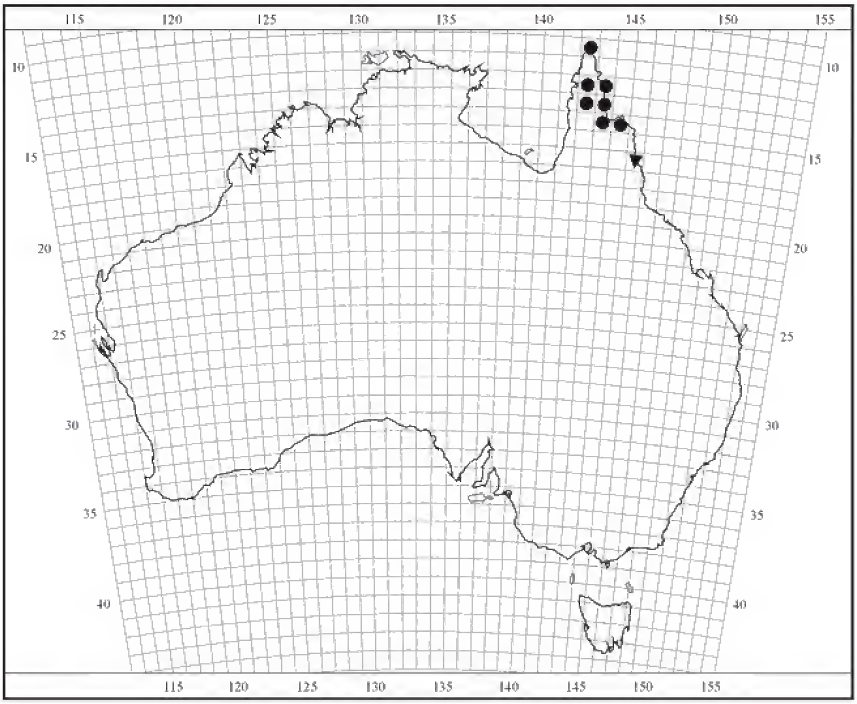
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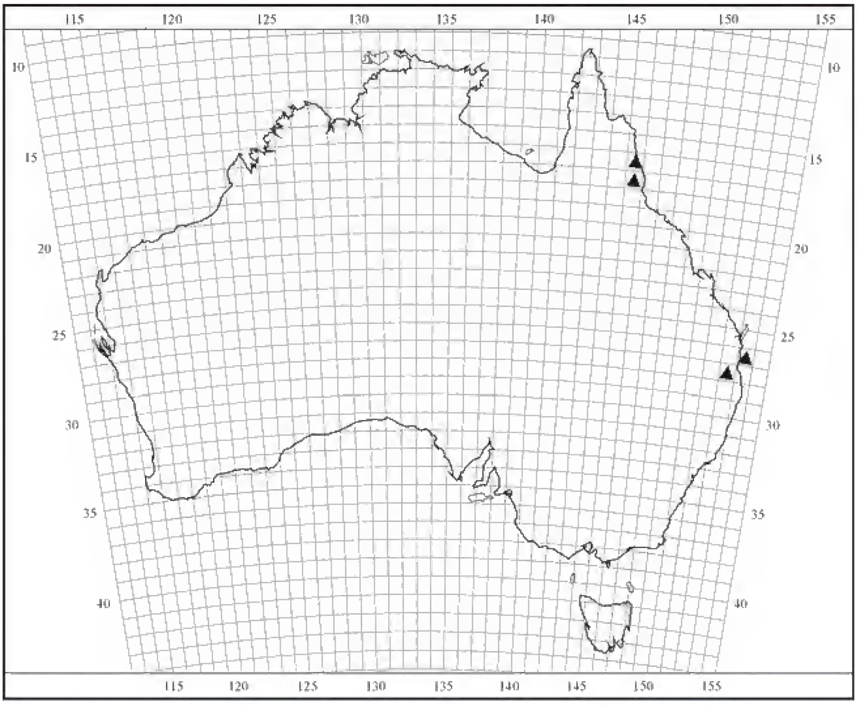
Map 1. Distribution in 1° grids in Australia for *Coffea liberica* ▼ and *Psilanthus brassii* ● .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Map 2. Distribution in 1° grids in Australia (excluding Lord Howe and Norfolk Islands) for *Coffea arabica* ▲ .

Caelospermum dasylobum (Rubiaceae), a new species from north-eastern Queensland

D.A. Halford and A.J. Ford

Summary

Halford, D.A. & Ford, A.J. (2004). *Caelospermum dasylobum* (Rubiaceae), a new species from north-eastern Queensland. *Austrobaileya* 6 (4) 911–915. *Caelospermum dasylobum* Halford & A.J.Ford is described, illustrated and diagnosed against related species. Notes on its habitat and distribution are provided.

Key words: *Caelospermum*, taxonomy, Australian flora, *Caelospermum dasylobum*, Rubiaceae

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Introduction

Caelospermum Bl. is a genus of mostly lianas distributed throughout South-east Asia, Malesia, Melanesia, New Guinea and Australia. In the most recent revision of the genus, Johannson (1988) recognised a total of seven species, with a single species *C. paniculatum* F.Muell. present in Australia. Johannson recognised two varieties of *C. paniculatum*: *C. paniculatum* var. *paniculatum* distributed from the Claudie River, north-eastern Queensland southwards to the Clarence River, north-eastern New South Wales and *C. paniculatum* var. *syncarpum* J.T.Johansson occurring on the Atherton Tableland, north-eastern Queensland. A second Australian species of *Caelospermum*, from the Mossman–Julatten area, is described here.

Methods

The study is based upon the examination of herbarium material from BRI and QRS and augmented by field observations made by the second author. The Herbarium acronyms follow Holmgren *et al.* (1990). All specimens cited have been seen by one or both authors.

Measurements of floral parts are based on material preserved in 70% ethanol. In this paper the term "compound syncarpous drupe" is used to describe the compound fruit of the species. The term "drupe" is used here as defined by Clifford and Dettmann (2001).

Taxonomy

Caelospermum dasylobum Halford & A.J.Ford, **sp. nov.** in clavi de Johannson (1988) advenit ad *C. salomonense* a quo corollae lobis dense pubescentibus et brevioribus (6–7 mm longis vice 9–11 mm longis), antheris brevioribus (3–3.5 mm longis vice 5.6–7.4 mm longis), ramulis inflorescentiae glabris (hispidulosis in *C. salomonensi*) et fructibis ubi maturis plus minusve flavo-aurantiacis usque flavo-brunneis (rubris in *C. salomonensi*) differt.*Caelospermum dasylobum* in fructibus drupam compositum syncarpum formentibus *C. paniculato* var. *syncarpo* similis autem ramulis inflorescentiae glabris (hispidulosis in *C. paniculato* var. *syncarpo*) fructibus ubi maturis plus minusve flavo-arantiacis usque flavo-brunneis (rubris usque purpureis in *C. paniculato* var. *syncarpo*), lobis corollae dense pubescentibus (glabris in *C. paniculato* var. *syncarpo*) et tubo corollae interdum longiore (5–7 mm longis vice 3–6 mm longis in *C. paniculato* var. *syncarpo*) differt. **Typus:** Queensland. Cook District: Chapman road, Kingfisher Park, Julatten, Dec 2002, *A. Ford* AF3785, *J. Holmes* & *D. McJannet* (holo: BRI; iso: K, L, MEL, MO, NSW, QRS, distribuendi).

Twining vine or scandent shrub with long arching stems. Stems terete, bark corky and fissured to tessellated, to 4cm diameter. Wood

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and roots yellow-orange. Branchlets ± terete, rarely angled, glabrous, longitudinally striated and becoming fissured with age. Leaves petiolate, opposite; stipules interpetiolar, sheathing, c. 1.5 mm long, produced into a narrow triangular lobe, glabrous, fragmenting as node thickens; petioles 5–12 mm long; laminae chartaceous when young becoming hard and stiff with age, narrowly elliptic or narrowly ovate, 6.5–13 cm long, 3.5–6.5 cm wide; adaxial and abaxial surfaces glabrous; venation brochidodromus with 5–12 lateral veins per side of midvein, slightly raised on adaxial surface, prominent on abaxial surface; base rounded to cuneate-obtuse; margins entire; apex acute or acuminate; pit domatia with a ring of hairs around the orifice present on most leaves in lateral vein axils on abaxial surface. Flowers fragrant, 4(5)-merous, bisexual, sessile, in congested capitula, joined at least by the base of the gynoecium. Capitula pedunculate, 4–6 mm across (excluding corollas), 3 or 4 (rarely 6)-flowered with colleters absent between flowers, in terminal paniculate umbel-like dichasial cymes or rarely axillary dichasial cymes, with peduncles 0.5–6 mm long, glabrous, terete. Primary axis of inflorescence 10–30 mm long, glabrous, terete; bracts c. 1mm long, glabrous; lower bracts broadly triangular or rarely foliaceous; upper bracts narrowly triangular. Calyx tube (including hypanthium) green, 1.5–2 mm long, 1.7–2 mm across, abaxial surface glabrous, with a single bristle-like bracteole (?) c. 0.8mm long occasionally present towards the base of the gynoecium; adaxial surface glabrous, with a ring of minute colleters at base; apex truncate, undulate or irregularly and shallowly toothed. Corolla valvate, deciduous, white and pale green turning yellow with age, glabrous on abaxial surface; tube 5–7 mm long, ± cylindrical, slightly widened at the mouth, fenestrated by short longitudinal splits in lower third of tube, glabrous and papillose on adaxial surface in proximal half but hairy and smooth distally; hairs simple, up to 0.5 mm long, white, spreading; lobes spreading and strongly recurved distally at anthesis, narrowly ovate, 6–7 mm long, 2–2.5 mm wide, acute and ± cucullate at apex, densely hairy adaxially; hairs as for corolla tube. Stamens exserted; filaments 1.6–4.5 mm long, inserted at the sinuses of the corolla lobes; anthers dorsifixed, linear-oblong, 3–3.5 mm long, glabrous, dehiscing laterally through longitudinal slits. Disc entire, flat, c. 0.5 mm high, glabrous. Ovary 2-celled, biovulate; style 5.5–8 mm long, exserted, glabrous; stigma bifid, with spreading lobes 2.5–4 mm long, adaxial surface and margin papillose, abaxial surface glabrous. Fruit a compound syncarpous drupe, subglobose or irregularly lobate, 20–25mm long and 15–30 mm across, ± yellow-orange to yellow-brown when ripe, glabrous, persistent calyx tubes not prominent on surface; pericarp firm, shell-like; mesocarp fleshy, containing several pyrenes. Pyrenes oblong in outline, 8–11 mm long, 5–6 mm wide, 2–3 mm thick, 1-seeded; endocarp cartilaginous, pale brown, rugose, with basal marginal groove. Seed 7–9 mm long, 3–4 mm wide, c. 1 mm thick; testa membraneous, dark brown; endosperm corneous, white; embryo 3.7–4.3 mm long, straight; cotyledons 1.6–2 mm long, 0.9–1.1 mm wide, thin, c. twice as broad as the radicle; radicle 1.9–2.3 mm long, 0.5–0.6 mm wide. **Fig. 1.**

Additional specimens examined**: Queensland.** COOK DISTRICT. Kingfisher Park, Julatten, Oct 2002, *Cooper* & *Cooper* WWC1791 (BRI); SFR 72, Pinnacle Mountain, Aug 1983, *Dansie* AFO5283 (QRS); SFR 1229, Black Mountain road, near Rifle Creek bridge, Aug 2003, *Ford* 4148 (BRI, QRS); Mt Perseverence road, near Nissen Creek via Julatten, Feb 2003, *Ford* AF3840 & *Holmes* (BRI); SFR 143, Little Mossman logging area, Jul 1980, *Gray* 20141V (QRS); ditto, Aug 1981, *Gray* 20193V (QRS); c. 1.5 km N of Julatten, adjacent to Kingfisher Park Bird Lodge, Sep 2002, *Halford* Q7385 & *Ford* (BRI); Kingfisher Park, Julatten, Oct 1998, *Holmes* 69 (QRS); SFR 1229, Danbulan, Feb 1993, *Hyland* 14638 (QRS); ditto, Aug 1992, *Hyland* 14506 (QRS); c. 1km S of "The Pinnacle" & c. 12km SSE of Mossman, Sep 1978, *Moriarty* 2461 (QRS); bank of Mossman River, near Mair [Marr] Creek, Apr 1998, *Sankowsky* 1625 (QRS); Rumula Creek, Oct 1939, *Twort* per *Sparvell* NQNC6570/71 (QRS).

Distribution and habitat**:** *Caelospermum dasylobum* is endemic to north-eastern Queensland, where it is currently known from the Julatten–Mossman district (**Map 1**). It is recorded as growing in mesophyll or notophyll rainforest on clay soils derived from mudstone. Common canopy trees include: *Cardwellia sublimis* F.Muell., *Darlingia darlingiana* (F.Muell.) L.A.S.Johnson, *Elaeocarpus grandis* F.Muell., *Castanospora alphandii* (F.Muell.) F.Muell., *Castanospermum australe* A.Cunn. & Fraser ex Hook., *Carnarvonia araliifolia* F.Muell. var. *araliifolia*, *Myristica globosa* subsp. *muelleri* (Warb.) W.J.deWilde and

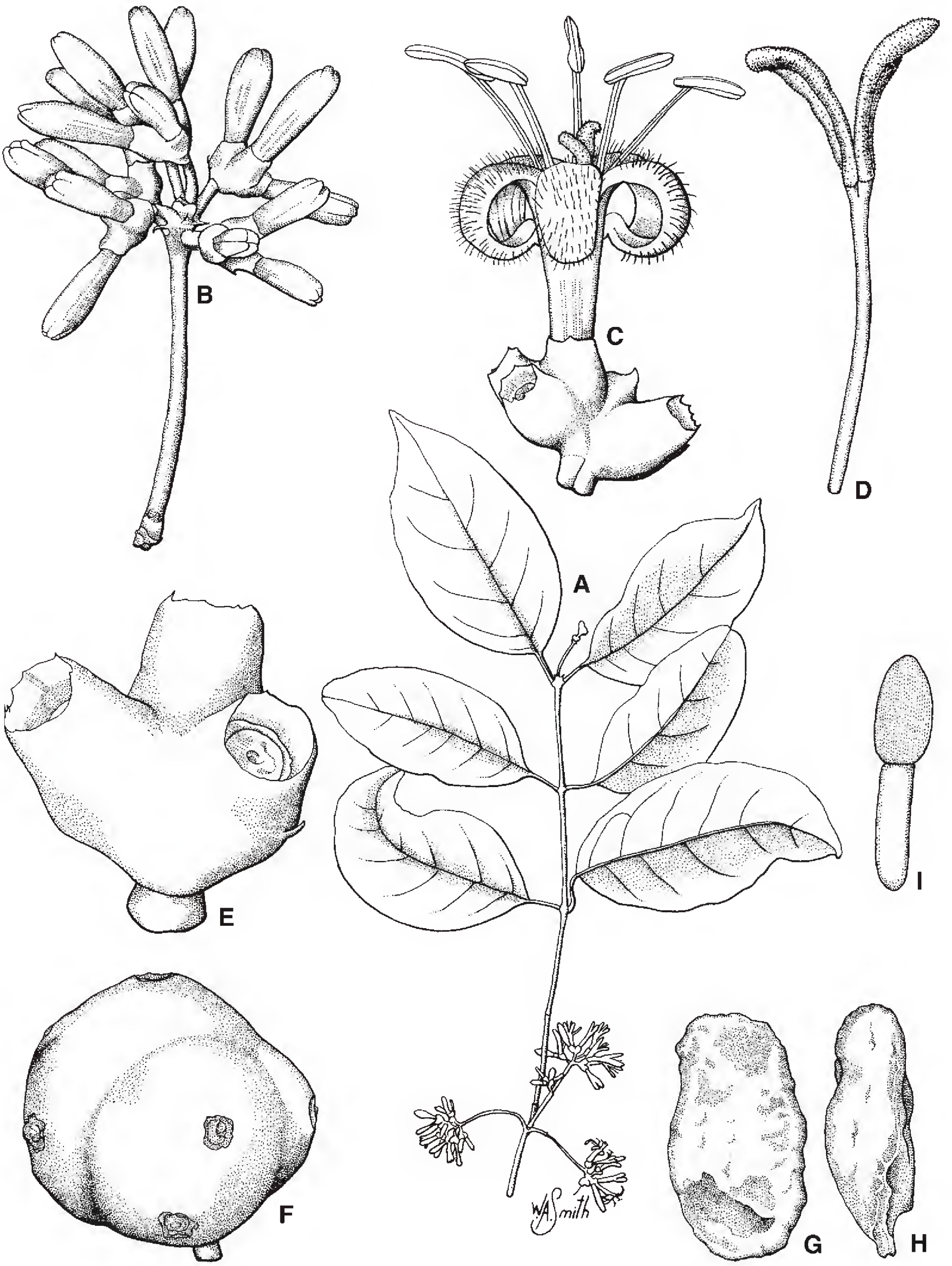

Fig. 1. ***Caelospermum dasylobum.*** A. branchlet with flowers × 0.4. B. part of inflorescence × 2. C. flower × 4. D. style × 8. E. fused ovaries with bracteole × 8. F. compound fruit × 1.5. G. adaxial view of pyrene × 6. H. lateral view of pyrene × 6. I. embryo ×8. A–E from *Ford et al.* AF3785 (BRI); F from *Cooper & Cooper* WWC1791 (BRI); G–I from *Halford* Q7385 & *Ford* (BRI). Del. W. Smith.

Alstonia scholaris (L.) R.Br. *Polyscias australiana* (F.Muell.)Philipson is a conspicuous sub-canopy species. At the type locality the rainforest is very fragmented from clearing and agriculture. Very small fragments exist with little or no canopy structure. In this case *C. dasylobum* occurs with *Guioa acutifolia* Radlk., *Cryptocarya triplinervis* R.Br. and *Rhamnella vitiensis* (Benth.) A.C.Sm. Altitudinal range is 20–600m, with most collections recorded at 400–450m.

Phenology: Flowers have been recorded in December, January and February whilst mature fruits have been recorded in September and October.

Affinities: *Caelospermum dasylobum* will key to *C. salomonense* in Johansson's (1988) key. It can be distinguished from *C. salomonense* by its densely hairy and shorter corolla lobes (6–7 mm long compared to 9–11 mm long for *C. salomonense*), shorter anthers (3–3.5 mm long compared to 5.6–7.4 mm long for *C. salomonense*), glabrous inflorescence branches (hispidulous for *C. salomonense*) and ± yellow-orange to yellow-brown fruit when ripe (red for *C. salomonense*).

Caelospermum dasylobum is similar to *C. paniculatum* var. *syncarpum* in its fruit that form a compound syncarpous drupe. However, it differs in having glabrous inflorescence branches (hispidulous for *C. paniculatum* var. *syncarpum*), ± yellow-orange to yellow-brown fruit when ripe (red to purple for *C. paniculatum* var. *syncarpum*), densely hairy corolla lobes (glabrous for *C. paniculatum* var. *syncarpum*) and generally longer corolla tube (5–7 mm long compared to 3–6 mm long for *C. paniculatum* var. *syncarpum*).

Conservation status: *Caelospermum dasylobum* has been collected within the World Heritage Area of the Wet Tropics bioregion in the vicinity of Black Mountain (Harris Peak), via Kuranda and also from the Julatten area (ex-SFR 143 and ex-SFR 72). However, it has not yet been recorded in a National Park area. No conservation status is recommended at this time, although a thorough search of adjacent lands might elucidate more records of this seldom seen species.

Notes: Leaves on strictly juvenile plants or seedlings in the understory have very narrow leaves compared to adult leaves. This vegetative feature is common within the genus of *Morinda*. Mature fruit of *C. dasylobum* lack the distinctive and pungent smell of rotting cheese, which is a well known attribute of *Morinda* fruit.

Etymology: The specific epithet is derived from the Greek *dasys* - very hairy, and *lobos* - lobe, and refers to the hairy corolla lobes of this species.

Acknowledgements

The authors wish to thank Will Smith for the illustration, Peter Bostock for the map and Les Pedley for the translation of the diagnosis into Latin. Jenny Holmes (Atherton) provided field assistance and showed the authors additional locations for distributional information. Staff at QRS (CSIRO, Plant Industry, Atherton) provided access to specimens. Permits to collect and traverse, in State Forest Reserve 1229, were issued by the Queensland Parks and Wildlife Service. The first author would like to thank Gordon Guymer, Director of BRI, for making available working space and facilities at BRI.

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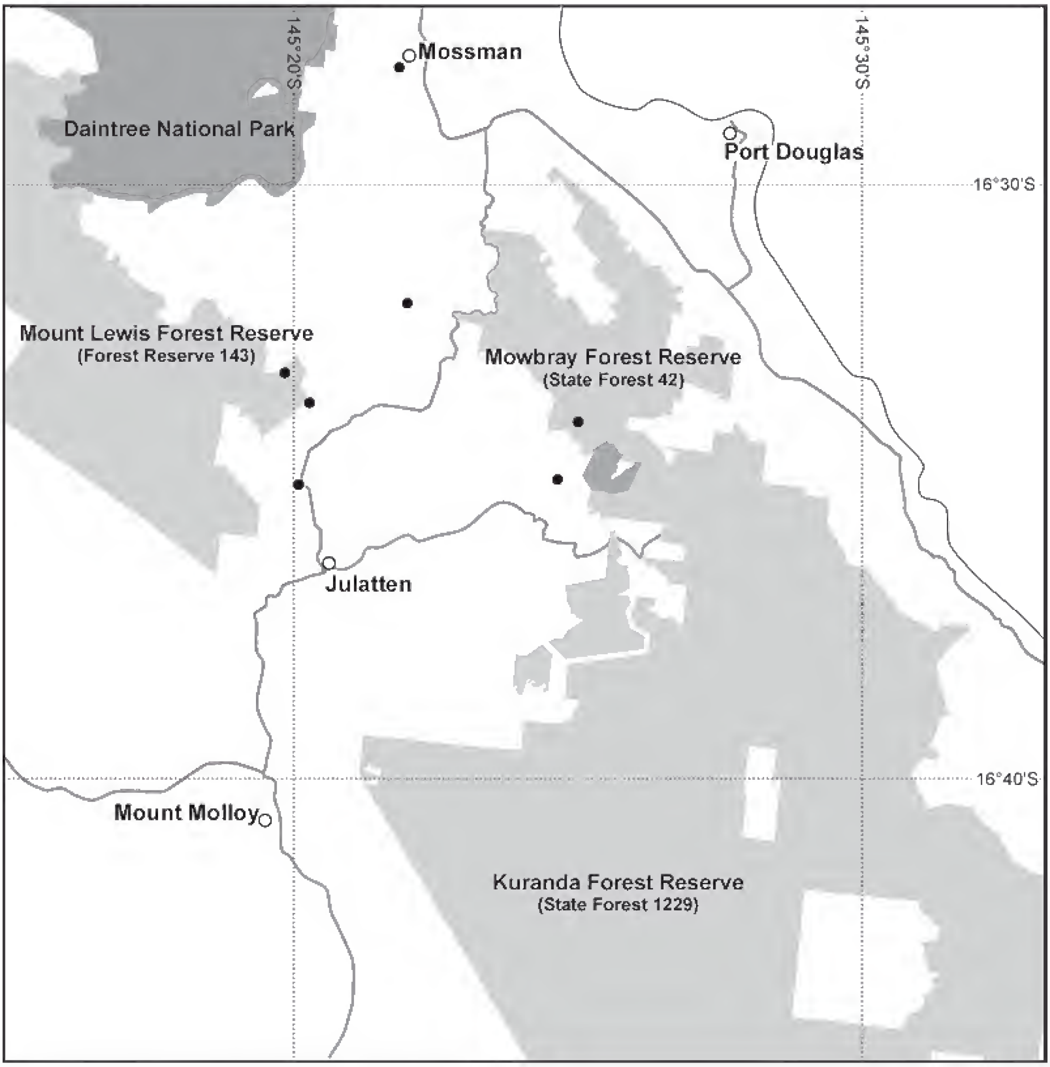
145°20'S
145°30'S
Mossman
Daintree National Park
Port Douglas
16°30'S
Mount Lewis Forest Reserve
(Forest Reserve 143)
Mowbray Forest Reserve
(State Forest 42)
Julatten
16°40'S
Mount Molloy
Kuranda Forest Reserve
(State Forest 1229)

Map 1. Distribution of *Caelospermum dasylobum* ● .

New species of *Cryptandra* Sm. and *Stenanthemum* Reissek (Rhamnaceae) from northern Australia

A.R. Bean

Summary

Bean, A.R. (2004). New species of *Cryptandra* Sm. and *Stenanthemum* Reissek (Rhamnaceae) from northern Australia. *Austrobaileya* 6 (4): 917–940. Seven new species of *Cryptandra*, and one new species of *Stenanthemum* are described and illustrated. One (*C. gemmata*) is from the Northern Territory, four (*C. debilis, C. filiformis, C. pogonoloba, S. argenteum*) are from northern Queensland, and three (*C. ciliata, C. orbicularis, C. rigida*) are from southern Queensland. Full diagnostic descriptions are given for all Queensland taxa and for *C. gemmata*. Distribution maps and an identification key are provided covering all Queensland species. Photographic images are provided for all newly described taxa. *C. armata* is newly recorded for New South Wales.

Key words: Queensland, Northern Territory, *Cryptandra, Stenanthemum,* taxonomy, key, Australian flora, new species, Rhamnaceae.

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Introduction

Cryptandra Sm. and *Stenanthemum* Reissek are endemic Australian genera found mostly in the southern non-arid parts of the continent, but with some representation in the subtropics and tropics. *Cryptandra* comprises about 40 species, and *Stenanthemum* about 30 species (Rye 1995; Walsh & Udovicic 1999).

Taxonomic problems associated with the Tribe Pomaderreae (e.g. *Cryptandra, Stenanthemum, Spyridium* Fenzl and *Trymalium* Fenzl) usually relate to the rather ill-defined distinctions between the genera.

Rye (1995) published numerous new species of both *Cryptandra* and *Stenanthemum* from Western Australia. She did not explicitly state the differences she perceived between these genera, but comparisons reveal that she interpreted *Stenanthemum* to have several to many flowers aggregated into dense head-like clusters surrounded by bracts and leaves, leaf margins incurved (conduplicate in bud), stipules on the upper side of the petiole (often connate), and a glabrous disc; with *Cryptandra* having a 1-flowered inflorescence usually subtended by a leaf, leaf margins recurved to revolute, stipules connate on lower side of petiole, and a densely stellate-hairy disc.

Walsh & Udovicic (1999) stated that (in Victoria) *Stenanthemum* has a several-flowered head-like inflorescence, sometimes surrounded by 'floral leaves', the individual flowers with 0–2 bracts, and the disc glabrous.

This paper presents new species from Queensland and the Northern Territory, and an identification key for all Queensland taxa. One of the new species clearly belongs in *Stenanthemum*, while the remainder have been placed in *Cryptandra*, although some of the northern species have some features not usually associated with *Cryptandra*.

While I have not had the opportunity to view many of the types of existing species, the respective protologues have been sufficiently detailed to satisfy me that none of the new species are synonymous with them. Indeed, some of the new taxa occur thousands of kilometres from related species and are very distinctive.

All *Cryptandra* and *Stenanthemum* species grow on infertile sandy soils, or sometimes on almost bare rock. Weed species are few on these substrates, and the threat from clearing or grazing is minimal. Only one of the species described in this paper is considered threatened under the criteria developed by the International Union for the Conservation of Nature (IUCN 2001).

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Taxonomy

Key to the Queensland species of *Cryptandra* and *Stenanthemum*

1. Lateral branchlets terminating in a spine 2
   Lateral branchlets not terminated by a spine 3

2. Leaf margins strongly recurved to revolute; calyx with simple adpressed hairs throughout .... **4. C. armata**
   Leaves flat or margins weakly recurved; calyx with stellate hairs throughout .... **2a. C. amara var. amara**

3. Upper leaf surface with dense stellate hairs 4
   Leaf upper surface glabrous, muricate, or with short simple hairs 5

4. Stipules 2.8–4.4 mm long, thread-like, stellate-hairy .... **13. C. filiformis**
   Stipules 1.7–2 mm long, broad-based, glabrous .... **12. C. pogonoloba**

5. Leaf margins revolute, lower surface rarely if ever visible (dried material) 6
   Leaves flat or margins recurved or incurved, lower surface always easily visible 11

6. Calyx tube and calyx lobes thickly covered by tangled woolly hairs .... **7. C. lanosiflora**
   Calyx tube and lobes glabrous or hairy, but without tangled woolly hairs 7

7. Bract margins conspicuously ciliate (cilia 0.4–0.6 mm long) .... **10. C. ciliata**
   Bract margins entire or with cilia 0.05–0.2 mm long 8

8. Bracts confined to very base of calyx tube, longest bracts 1.0–1.3 mm long 9
   Bracts covering most or all of calyx tube, longest bracts 2.1–3.8 mm long 10

9. Leaf apex acute to mucronate; style densely hairy; bracts glabrous on outer surface .... **1. C. debilis**
   Leaf apex obtuse; style glabrous; bracts stellate-hairy on outer surface .... **3. C. amara var. floribunda**

10. Calyx tube glabrous (except adjacent to lobes); bracts (at anthesis) covering 50–90% of tube .... **9. C. rigida**
    Calyx tube stellate-hairy throughout; bracts (at anthesis) covering all of calyx tube and part of calyx lobes .... **8. C. propinqua**

11. Lower leaf surface white, densely hairy 12
    Lower leaf surface green, glabrous or very sparsely hairy 14

12. Leaves 1.8–4 mm long; stipules 0.6–1.1 mm long .... **6. C. longistaminea**
    Leaves 5–16 mm long; stipules 2–3.8 mm long 13

13. Leaves recurved; inflorescence with conspicuous masses of woolly hair; south Qld .... **15. Stenanthemum scortechinii**
    Leaves flat or incurved; inflorescence without woolly hairs; north Qld .... **14. Stenanthemum argenteum**

14. Leaves oblanceolate to obovate, 2–4 times longer than broad; petals protruding 0.4–0.6 mm beyond calyx tube; longest bracts 0.7–0.8 mm long, covering 0–20% of calyx tube .... **2a. C. amara var. amara**
    Leaves orbicular to reniform, 0.8–1.3 times longer than broad; petals extending 0.8–1.1 mm beyond calyx tube; longest bracts 1.2–1.5 mm long, covering 50–100% of calyx tube .... **5. C. orbicularis**

1. Cryptandra debilis A.R.Bean **sp. nov.** affinis C. amarae var. floribundae Maiden & Betche, sed stylo longiore pilis densis in dimidio inferiore, calyce longiore, apicibus foliorum acutis et ramulis saepe glabris differens. **Typus:** Queensland. Cook District: Baal Gammon, E of Watsonville, 18 May 1997, *R.L. Jago* 4379 & *B. Wannan* (holo: BRI; iso: NSW).

Cryptandra amara var. (Mt Mulligan J.R. Clarkson 5865) in Bean (2002)

Shrub to 0.3 m high, lateral branchlets 1–8 cm long, not terminating in a spine. Young branchlets often glabrous, sometimes with simple adpressed hairs overlying small stellate hairs. Older branches glabrous. Stipules connate on lower side of petiole, persistent, narrowly triangular, 1.3–1.6 mm long. Leaves in fascicles (2–8 per node), petioles 0.3–0.5 mm long; lamina terete, linear, 2.5–6.5(–12) mm long, 0.5–0.7(–1.0) mm wide, 5–10 times longer than broad, apex acute to mucronate, margins strongly revolute; upper surface green, glabrous; lower surface (rarely visible) white, indumentum dense throughout, with simple hairs overlying small stellate hairs. Inflorescences 1–4 flowered, anthopodia 0.1–0.5 mm long; floral bracts 3–6, broadly ovate to orbicular, 1.1–1.3 mm long, brown, outer surface glabrous, apex obtuse or acute, margin entire or with cilia 0.05–0.1 mm long. Calyx white; calyx tube cylindrical, 1.2–1.5 mm long, indumentum dense throughout, with simple adpressed hairs overlying small stellate hairs, 0–20% of tube obscured by bracts at anthesis; calyx lobes erect, 1.0–1.2 mm long, indumentum dense throughout, with simple adpressed hairs overlying small stellate hairs. Petals hooded, white, protruding 0.4–0.5 mm beyond calyx tube. Disc densely stellate hairy, obscurely 10-lobed. Style 0.6–0.7 mm long, densely hairy on lower half, stigma 3-lobed. Schizocarps ellipsoidal, c. 2.6 mm long, 3-locular, c. 20% inferior, ovary roof with sparse stellate and simple indumentum, disc forming a narrow densely stellate-hairy annulus at the base of the persistent calyx, mericarps dehiscent by a ventral slit. Seeds flattened, elliptical in outline, c. 1.8 mm long excluding aril. Aril white, terminal. **Fig. 1.**

***Selected specimens*: Queensland.** Cook District: near Mt Emerald, SW of Walkamin, Jul 1998, *Bean* 13751 (BRI); Mt Mulligan, 0.5 km SE of dam on summit of Mt, c. 40 km NW of Dimbulah, Apr 1985, *Clarkson* 5865 (BRI); Toys Creek, W of Herberton, Powerline access road, Feb 1996, *Forster* PIF18442 (BRI). North Kennedy District: TR245, Snubby Ck, near Ravenshoe, Apr 1999, *McDonald* 2 (BRI); 11 km NE of Innot Hot Springs, on the Silver Valley road, Jan 2001, *Wannan* 2034 & *Younghusband* (BRI).

***Distribution and habitat*:** Found on the western parts of the Atherton Tableland, and on Mt Mulligan further north (**Map 2**). It grows on granite or sandstone ridges in shrubland.

***Phenology*:** Flowers mostly from April to July, but also in January and February.

***Affinities*:** *Cryptandra debilis* is related to *C. amara* var. *floribunda*, but differs by the often glabrous branchlets (vs. always hairy), bract outer surface glabrous (vs. stellate hairy), acute to mucronate leaf apices, the longer calyx (both tube and lobes), the style 1.1–1.3 mm long with dense hairs on lower half (vs. 0.6–0.7 mm long, glabrous throughout), and the schizocarp only about 20% inferior (vs. 60–70%).

***Etymology*:** From the Latin *debilis*, meaning weak or feeble. This is a reference to the small stature of the plant, compared with other related species.

2. Cryptandra amara Sm. in Rees, Cycl. 10, sect. 2 (1808). **Type:** New South Wales. in the neighbourhood of Port Jackson, undated, *J. White s.n.* (holo: LINN, *n.v.*, microfiche 294.1).

There are two varieties treated separately in the key to species.

2a. Cryptandra amara var. **amara**

Cryptandra amara var. *longiflora* F.Muell. ex Maiden & Betche, Proc. Linn. Soc. New South Wales 28: 905 (1904). **Type:** not cited.

Cryptandra sp. (Thulimbah C. Schindler 6) in Bean (2002)

Cryptandra sp. 3, in Briggs & Leigh (1996)

Shrub 0.3–0.9 m high, lateral branchlets 0.5–2 cm long, sometimes terminating in a spine. Young branchlets with small stellate hairs only. Older branches glabrescent. Stipules connate

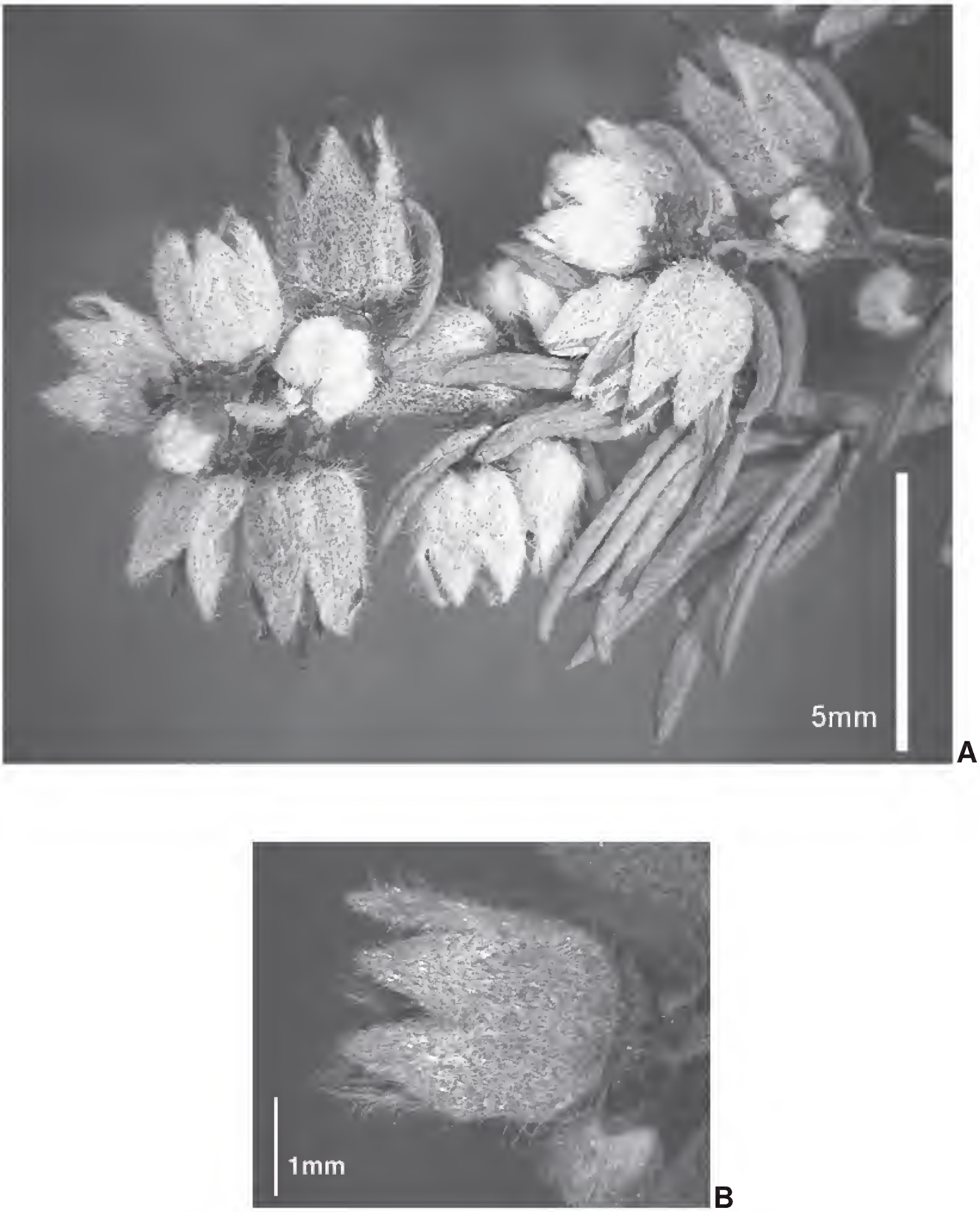


Fig. 1. ***Cryptandra debilis***. A. flowering branchlet (*McDonald* 2); B. side view of flower, showing predominantly simple hairs on calyx and very short bracts (*McDonald* 2).

on lower side of petiole, persistent, triangular, 0.9–1.3 mm long. Leaves only rarely in fascicles (1(–3) per node), petioles 0.2–0.4 mm long; lamina oblanceolate or obovate, 2.2–6.0 mm long, 0.8–2.3 mm wide, 2–4 times longer than broad, apex obtuse, lamina flat or margins recurved; upper surface green, glabrous; lower surface green, glabrous or with a few simple hairs on midrib. Inflorescences 1- flowered, anthopodia 0.4–1.2 mm long; floral bracts 5–7, orbicular, inner ones 0.7–0.8 mm long, brown, outer surface glabrous, apex obtuse, margin with cilia c. 0.05 mm long. Calyx white to creamy; calyx tube cylindrical to urceolate, 0.7–1.5 mm long, with dense small stellate hairs throughout, 0–20% of tube obscured by bracts; calyx lobes erect to spreading, 0.9–1.3 mm long, with the same indumentum as the tube. Petals hooded, white, protruding 0.4–0.6 mm beyond calyx tube. Disc densely stellate hairy, obscurely 10-lobed. Style 0.7–0.9 mm long, glabrous, stigma entire or 3-lobed. Schizocarps ellipsoidal, 3-locular, c. 2.4 mm long, 30–40% inferior, with ovary roof sparsely stellate-hairy, disc forming a narrow densely stellate-hairy annulus at the base of the persistent calyx, mericarps dehiscent by a ventral slit. Seeds not seen.

***Selected specimens*: Queensland.** Darling Downs District: c. 1 km ENE of Gambubal Forest Station, E of Warwick, Oct 1996, *Bean* 10987 (BRI, MEL, NSW); Bald Rock Creek, Mt Norman fire trail, Girraween N.P., Aug 1995, *Forster* PIF17609 & *Figg* (BRI, CANB, MEL); Rhumbalara Railway crossing, Fletcher Lane, Fletcher, Aug 1996, *Grimshaw* PG2544 & *Bean* (BRI). Moreton District: Double Peak, Mt Ballow area, McPherson Range, Sep 1990, *Forster* PIF7421 & *Leiper* (BRI, CANB, K, MEL, NSW). Leichhardt District: Boyd Creek, SF46, c. 70 km W of Taroom, Sep 2002, *Bean* 19263 (BRI).

***Distribution and habitat*:** In Queensland, *C. amara* var. *amara* is known mainly from the ‘Granite Belt’ surrounding the town of Stanthorpe, but also occurs disjunctly at Mt Ballow, and near Taroom (**Map 3**). It inhabits rocky ridges and mountaintops on sandstone, granite or other acidic substrates.

***Phenology*:** Flowers from August to October; fruits in October.

***Notes*:** This taxon sometimes has spinose lateral branchlets, and hence it can be confused with *C. armata*.

3. Cryptandra amara var. **floribunda** Maiden & Betche, Proc. Linn. Soc. New South Wales 29: 736 (1905). **Types:** Howell, July 1904, *J.L. Boorman* (syn: BRI!, NSW?); Stanthorpe, Queensland, July 1904, *J.L. Boorman* (syn: NSW?).

Shrub to 0.6 m high, lateral branchlets 1–4 cm long, not terminating in a spine. Young branchlets with simple adpressed hairs overlying small stellate hairs. Older branches glabrescent. Stipules connate on lower side of petiole, persistent, narrowly triangular, 1.0–1.3 mm long. Leaves often in fascicles (1–8 per node), petioles 0.2–0.3 mm long; lamina terete, linear, 1.8–3.5 mm long, 0.4–0.6 mm wide, 3–8 times longer than broad, apex obtuse, margins strongly revolute; upper surface green, glabrous, sometimes muricate; lower surface (rarely visible) white, indumentum dense throughout, with simple hairs overlying small stellate hairs. Inflorescences 1–3 flowered, anthopodia 0.3–0.5 mm long; floral bracts 4–6, broadly ovate to orbicular, 1.0–1.2 mm long, brown, outer surface stellate hairy, apex obtuse, margin entire or with cilia 0.05–0.1 mm long. Calyx white; calyx tube campanulate, 0.8–1.0 mm long, indumentum dense throughout, with simple adpressed hairs overlying small stellate hairs, 0–20% of tube obscured by bracts at anthesis; calyx lobes erect, 0.7–0.9 mm long, indumentum dense throughout, with simple adpressed hairs overlying small stellate hairs. Petals hooded, white, protruding 0.3–0.5 mm beyond calyx tube. Disc densely stellate hairy, obscurely 10-lobed. Style 0.6–0.7 mm long, glabrous throughout, stigma entire. Schizocarps ellipsoidal, 2.0–2.6 mm long, 3-locular, 60–70% inferior, ovary roof with sparse stellate indumentum, disc forming a narrow densely stellate-hairy annulus at the base of the persistent calyx, mericarps dehiscent by a ventral slit. Seeds flattened, elliptical in outline, c. 1.2 mm long excluding aril. Aril white, terminal.

***Selected specimens*: Queensland.** Darling Downs District: Portion 90, Wyberba, Aug 1995, *Forster* 17587 & *Figg* (BRI); Ballandean, Oct 1933, *White* 9397 (BRI).

***Distribution and habitat*:** Widespread in New South Wales, but in Queensland it is confined to the ‘Granite Belt’, around Stanthorpe (**Map 2**). It grows on granitic hills and ridges with shallow soil.

***Phenology*:** Flowers are recorded from August to October.

***Notes*:** This taxon is amply distinct from *C. amara* var. *amara*, and should be accorded species rank. Walsh & Udovicic (1999) foreshadowed this, and suggested that *C. tomentosa* Lindl. may be the appropriate name.

4. Cryptandra armata C.T.White & W.D.Francis, Proc. Roy. Soc. Queensland 33: 153 (1922). **Type:** Queensland. Darling Downs District: Barakula, a few miles north of Chinchilla, July 1919, *J.E. Young s.n.* (holo: BRI).

Shrub to 1.5 m high, lateral branchlets 0.5–1.5 mm long, terminating in a spine. Young branchlets with simple adpressed hairs overlying small stellate hairs. Older branches glabrescent. Stipules connate on lower side of petiole, persistent, narrowly triangular, 0.9–1.4 mm long. Leaves often in fascicles (1–5 per node), petioles 0.3–0.5 mm long; lamina oblanceolate, obovate or spathulate, 1.4–5.2 mm long, 0.4–1.4 mm wide, 2–5 times longer than broad, apex obtuse or acute, margins recurved; upper surface green, glabrous; lower surface green, glabrous or with a few simple hairs on midrib. Inflorescences 1-(2-) flowered, anthopodia 0.5–1 mm long; floral bracts several, orbicular, 1.3–1.6 mm long, brown, outer surface glabrous, apex obtuse, margin with cilia 0.05–0.15 mm long. Calyx white to creamy; calyx tube cylindrical to campanulate, 2.5–3 mm long, with dense adpressed simple hairs overlying small stellate hairs, 15–25% of tube obscured by bracts at anthesis; calyx lobes erect to spreading, 1–1.6 mm long, with the same indumentum as the tube. Petals hooded, white, protruding 1–1.2 mm beyond calyx tube. Disc densely stellate hairy. Style 1.5–2.8 mm long, with dense stellate hairs on lower third; stigma entire or 3-lobed. Schizocarps ellipsoidal, 3-locular, 3–3.5 mm long, ovary superior or 10% inferior, ovary roof with sparse stellate indumentum, disc forming an annulus of dense stellate hairs at base of the persistent calyx, mericarps dehiscent by a ventral slit. Seeds flattened, elliptical in outline, c. 2.3 mm long excluding aril. Aril white, terminal. **Fig. 2.**

***Selected specimens*:** **Queensland.** Port Curtis District: Castletower N.P., east slopes Many Peaks Range, Feb 1995, *Forster* PIF16331 (BRI); Castletower N.P., site 297, Oct 1995, *Thompson* MIR87 & *Price* (BRI). Maranoa District: "Boxleigh", S of Surat, Aug 2001, *Bean* 17765 (BRI); Chesterton Range N.P., c. 15 km E of Wineba house, Apr 1998, *Dollery s.n.* (BRI). Burnett District: on SF130, 2 km NW of Nantglyn, Sep 1989, *Forster* 5738 & *Bean* (BRI); northern boundary of SF132, 35 km SSW of Mundubbera, Jul 1997, *Halford* Q3305 & *Holland* (BRI); "Narayan", Bull Paddock, Jul 1968, *McHarg* H529 (BRI). Darling Downs District: 3.7 km along Booroondoo Rd, S of Moonie, Sep 1997, *Bean* 12368 (BRI); 11.6 km along Boondandilla Rd, W of Milmerran, Oct 1998, *Bean* 13903 (BRI); Spinifex Heath, Wondul Range, Aug 1995, *Forster* 17508 & *Figg* (BRI); SF132, c. 8.5 km WNW of Limevale, Oct 1994, *Sparshott* KMS404 & *Bean* (BRI). **New South Wales.** North Western Slopes: Severn River, 16.1 km from Bukkulla, c. 21 km SE of Ashford, Oct 1990, *Coveny* 14582 (BRI, NSW).

***Distribution and habitat*:** *C. armata* is found as far north as Gladstone, west to Morven and south to Ashford in New South Wales (**Map 2**). It grows in sandy soil (sometimes skeletal), on granite or sandstone substrate.

***Phenology*:** It flowers from July to September, and fruits from September to February.

***Notes*:** *C. armata* is the only consistently spinose species in northern Australia. The specimen from near Ashford (Coveny 14582) is the first record of the species from New South Wales.

5. Cryptandra orbicularis A.R. Bean **sp. nov.** affinis C. longistamineae F.Muell., sed folia orbicularia usque reniformibus pagina inferiore glabra vel glabriuscula, calycis tubo pilis sparsis usque densis praedito et petalis brevibus differens. **Typus:** Queensland. Leichhardt District: Expedition National Park, NW of Taroom, Robinson Creek headwaters, 14 September 2000, *P.I. Forster* PIF26173, *R. Booth & F. Carter* (holo: BRI; iso: MEL, NSW).

Cryptandra sp. (Isla Gorge P. Sharpe 627) in Bean (2002)

Shrub 0.3–0.9 m high, lateral branchlets 1–5 cm long, not terminating in a spine. Young branchlets with small white stellate hairs only, or sometimes also with a few simple patent to adpressed hairs. Older branches glabrescent. Stipules connate on lower side of petiole, persistent, narrowly triangular, 0.9–1.2 mm long. Leaves usually solitary, but occasionally in fascicles of up to 4, orbicular, reniform, or

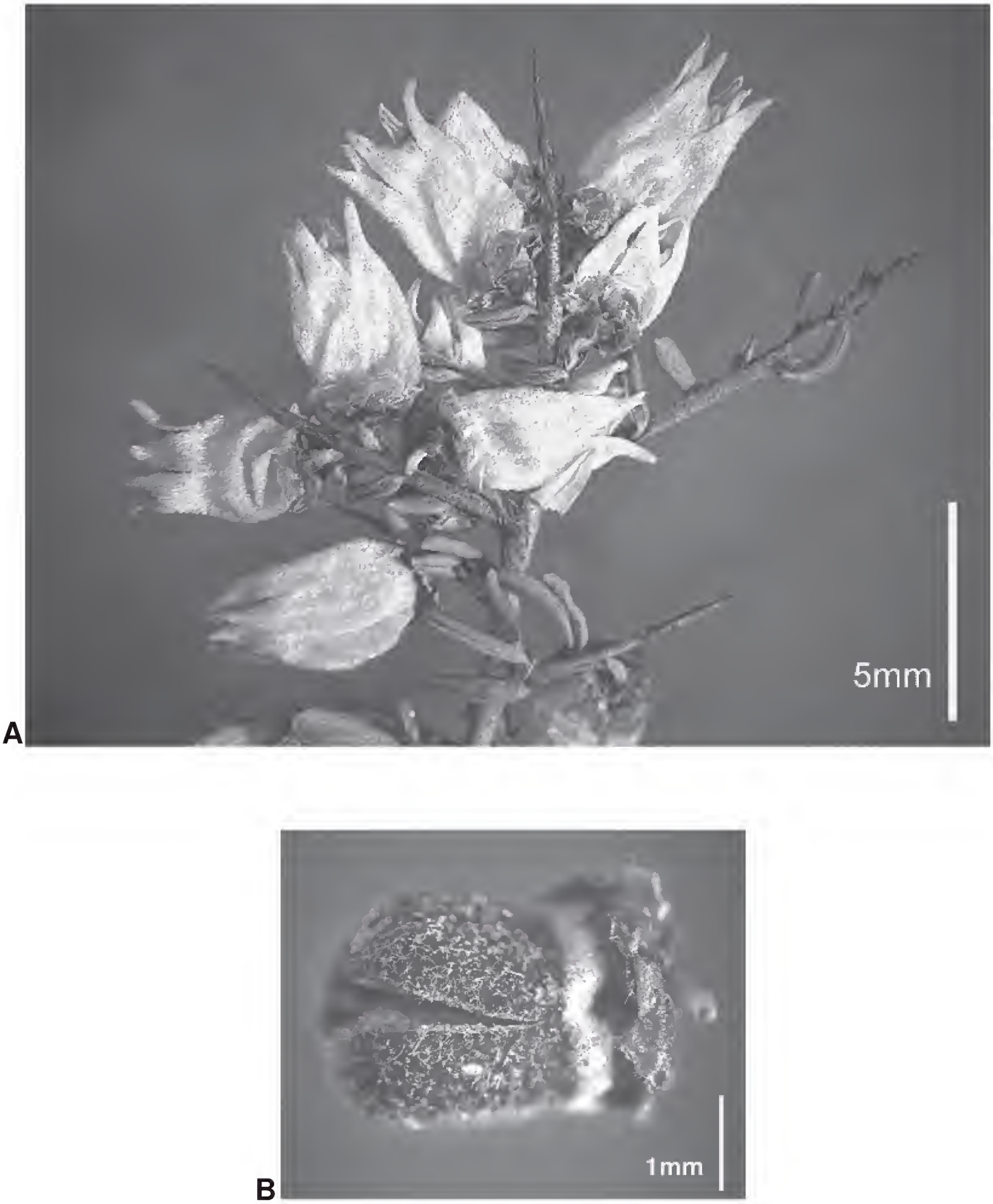


Fig. 2. ***Cryptandra armata***. A. flowering branchlets with spinose tips (*Bean* 17765); B. mature schizocarp (*Forster* 5738 & *Bean*).

broadly obovate, 1.3–2.5 mm long, 1.3–2.2 mm wide, 0.8–1.3 times longer than broad, apex obtuse, lamina flat or margins recurved; upper surface green, glabrous; lower surface green, glabrous or with a few simple hairs on midrib. Inflorescences 1- flowered, anthopodia 0.3–0.6 mm long; floral bracts several, elliptical, inner ones 1.2–1.5 mm long, brown, outer surface stellate-hairy, apex obtuse, margin with cilia 0.05–0.15 mm long. Calyx white to creamy; calyx tube cylindrical to campanulate, 0.9–1.1 mm long, with sparse to dense small stellate hairs throughout, or sometimes almost glabrous, 50–100% of tube obscured by bracts; calyx lobes spreading, 1.3–1.5 mm long, with a mixture of adpressed simple hairs and small stellate hairs. Petals hooded, white, protruding 0.8–1.1 mm beyond calyx tube. Disc densely stellate hairy. Style 1.3–2.0 mm long, glabrous throughout, distinctly 3-lobed. Mature schizocarps not seen. Immature schizocarps ellipsoidal, 50% inferior, ovary roof sparsely stellate hairy, disc forming a narrow densely stellate-hairy annulus at the base of the persistent calyx. Seeds not seen. **Fig. 3.**

***Selected specimens*: Queensland.** Leichhardt District: Precipice N.P., catchment of Precipice Ck, Sep 1996, *Forster* PIF19741 (BRI, MEL); 38 km NE of Taroom, 'Spring Creek' station, Oct 1996, *Halford* Q3181 (BRI); Isla Gorge, c. 28 km SW of Theodore, Aug 1973, *Sharpe* 627 & *Hockings* (BRI).

***Distribution and habitat*:** *C. orbicularis* is confined to south-eastern Queensland, between Cracow and Rolleston (**Map 2**). It grows on sandstone ridges in shrubby eucalypt woodland.

***Phenology*:** Flowers recorded from August to October.

***Affinities*:** *Cryptandra orbicularis* is clearly related to *C. longistaminea*, but differs by the leaves orbicular to reniform (vs. elliptical to obovate), the lower leaf surface green, glabrous or with a few simple hairs on midrib (vs. white, very densely hairy throughout); calyx tube with sparse to dense stellate hairs (vs. glabrous); calyx lobes with a mixture of adpressed simple hairs and small stellate hairs (vs. stellate hairy throughout, sometimes with a few simple adpressed hairs); style 1.3–2.0 mm long (vs. 2.0–2.3 mm long); and petals protruding 0.8–1.1 mm beyond calyx tube (vs. 1.4–1.8 mm beyond calyx tube).

***Etymology*:** the epithet refers to the frequently orbicular leaves in this species.

6. Cryptandra longistaminea F.Muell., Fragm. 3: 64 (1862). **Type:** Severn River, New England, undated, *C. Stuart s.n.* (holo: ?MEL, *n.v.*).

Shrub to 1 m high, lateral branchlets 1–5 cm long, not terminating in a spine. Young branchlets with small white stellate hairs only, each hair c. 0.1 mm diameter. Older branches glabrescent. Stipules connate on lower side of petiole, persistent, narrowly triangular, 0.6–1.1 mm long. Leaves usually solitary, but occasionally in fascicles of up to 4, petioles 0.2–0.6 mm long; lamina elliptical to obovate, 1.8–4.0 mm long, 0.9–1.7 mm wide, 1.5–2.5 times longer than broad, apex acute, margins recurved; upper surface green, glabrous; lower surface white, densely stellate-hairy, with a few erect simple hairs on midrib. Inflorescences 1- flowered, anthopodia 0.3–0.8 mm long; floral bracts several, elliptical, to 1.0–1.2 mm long, brown, outer surface glabrous, apex obtuse, margin with cilia 0.05–0.1 mm long. Calyx white to creamy; calyx tube cylindrical to campanulate, 1.0–1.3 mm long, glabrous, 10–70% of tube obscured by bracts; calyx lobes erect to spreading, 1.7–2.0 mm long, with a thin layer of small stellate hairs throughout, and sometimes with a few adpressed simple hairs at the apex. Petals hooded, white, protruding 1.4–1.8 mm beyond calyx tube. Disc densely stellate hairy. Style 2.0–2.3 mm long, glabrous throughout, stigma distinctly trifid. Mature schizocarps not seen. Immature schizocarps ellipsoidal, c. 50% inferior, ovary roof with sparse stellate indumentum, disc forming an annulus of dense stellate hairs at the base of the persistent calyx. Seeds not seen.

***Selected specimens*: Queensland.** Port Curtis District: near tributary of East Boyne River, Many Peaks Range, Jun 1995, *Thompson* CAL325 & *Turpin* (BRI). Darling Downs District: 9 km W of Bringalily Forestry lookout tower, Sep 1992, *Forster* PIF11639 & *Machin* (BRI, MEL). Burnett District: 7.8 km W of Cynthia, S of Monto, Sep 1999, *Bean* 15313 & *McDonald* (BRI); about 13.5 km SSE of Allies Creek, Jul 1998, *Pollock* ABP663 & *Dean* (BRI). Moreton District: 1 km E of Swanbank Power station, Nov 1988, *Bostock & Forster s.n.* (BRI); Buchanans Fort, Christmas Creek area, Sep 1995, *Forster* PIF17675 & *Leiper* (BRI, CANB).

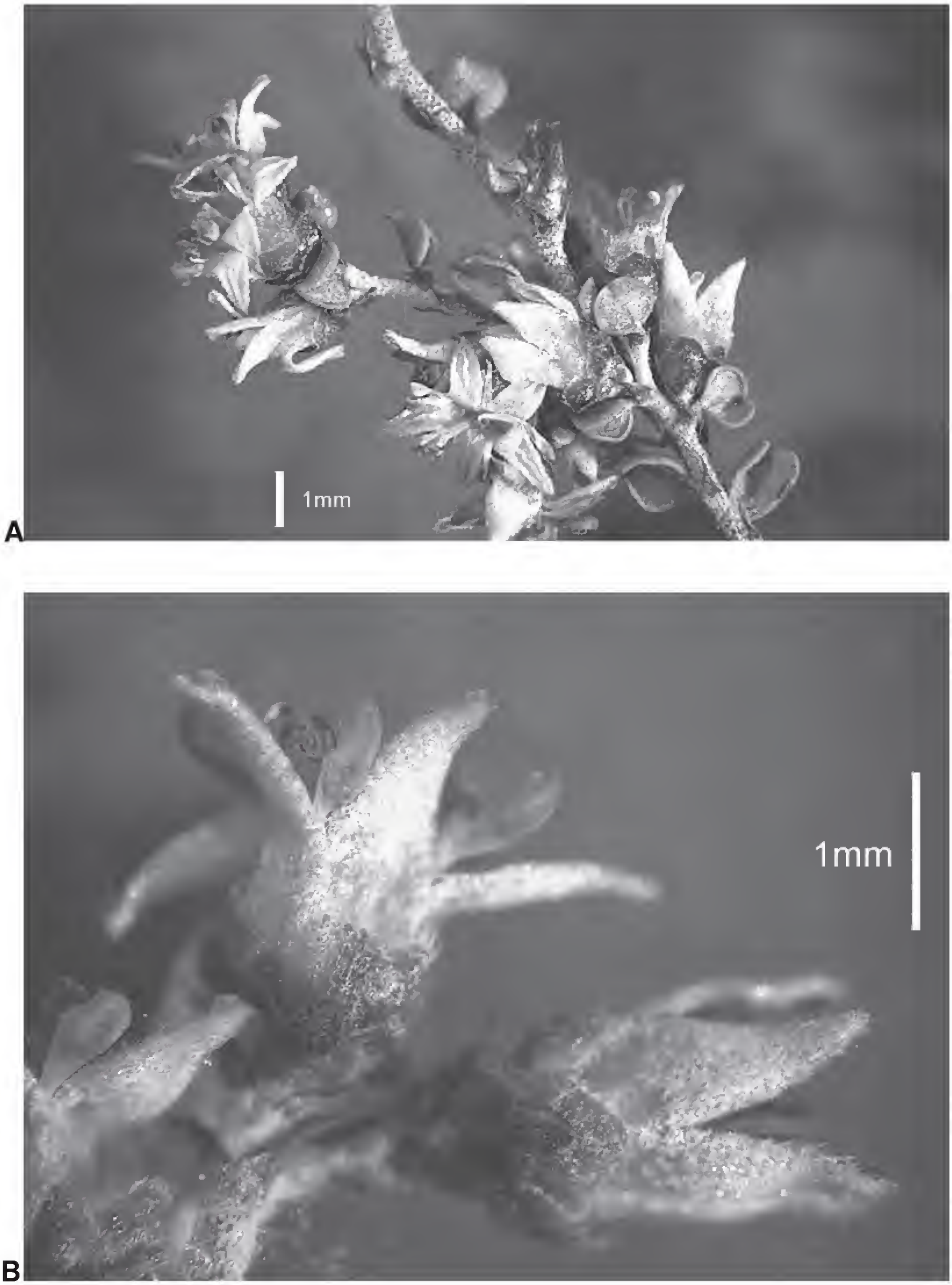


Fig. 3. ***Cryptandra orbicularis***. A. flowering branchlet (*Pollock* 1261); B. flowers, showing the bracts, recurved calyx lobes and relatively long petals (*Pollock* 1261).

***Distribution and habitat*:** Found in south-eastern Queensland, south from about Gladstone (**Map 3**). It is widespread in New South Wales.

***Phenology*:** Flowers recorded from June to September; fruits in November.

***Notes*:** Some specimens from the Burnett District are atypical, because of the dense simple hairs on the upper leaf surface. It is not yet known whether these specimens represent an unnamed taxon.

7. Cryptandra lanosiflora F.Muell., Fragm. 3: 65 (1862). **Type:** Severn River, New England, undated, *C. Stuart s.n.* (syn: ?MEL, *n.v.*); Mt Mitchell towards the Clarence river, undated, *H. Beckler* (syn: ?MEL, *n.v.*).

Shrub to 0.6 m high, lateral branchlets 1–3 cm long, not terminating in a spine. Young branchlets with simple adpressed hairs overlying small stellate hairs. Older branches glabrescent. Stipules connate on lower side of petiole, persistent, narrowly triangular, 0.9–1.8 mm long. Leaves in fascicles (2–7 per node), petioles 0.2–0.5 mm long; lamina terete, ellipsoidal, 1.3–3.2 mm long, 0.6–0.8 mm wide, 2–5 times longer than broad, apex obtuse or acute, margins strongly revolute; upper surface green, glabrous, muricate, or with short simple hairs; lower surface (rarely visible) white, indumentum dense throughout, with simple hairs overlying small stellate hairs. Inflorescences 1- flowered, anthopodia 0.3–0.5 mm long; floral bracts several, orbicular, 1.8–2.1 mm long, brown, outer surface glabrous or with a few simple hairs, apex obtuse, margin with cilia 0.1–0.15 mm long. Calyx white; calyx tube ovoid, 1.5–1.8 mm long, with dense tangled simple hairs, 50–75% of tube obscured by bracts at anthesis; calyx lobes erect, 1.2–1.3 mm long, with the same indumentum as the tube. Petals hooded, white, protruding 0–0.3 mm beyond calyx tube. Disc densely stellate hairy, obscurely 10-lobed. Style 0.6–0.8 mm long, glabrous throughout, stigma entire or 3-lobed. Schizocarps obovoid, 3-locular, 2.3–2.6 mm long, 60–70% inferior, ovary roof with sparse stellate indumentum, disc forming a narrow densely stellate-hairy annulus at the base of the persistent calyx, mericarps dehiscent by a ventral slit. Seeds flattened, elliptical in outline, 1.2–1.4 mm long excluding aril. Aril white, terminal.

***Selected specimens*:** **Queensland.** Darling Downs District: upper reaches Bald Rock Creek, Girraween N.P., Sep 1993, *Forster* 13833 & *Bean* (BRI); Mt Jibbenbar, Sundown N.P., 34 km WSW of Stanthorpe, Sep 1996, *Halford* Q2949 (BRI); Wyberba, Bald Rock Creek, Oct 1963, *Pedley* 1549 (BRI).

***Distribution and habitat*:** In Queensland, confined to the Stanthorpe area. It also occurs on the northern tablelands of N.S.W. It grows on granite hills in eucalypt woodland.

***Phenology*:** Flowers and fruits recorded for September and October.

***Notes*:** *C. lanosiflora* is immediately distinguishable by the dense white woolly hairs on the calyx.

8. Cryptandra propinqua Fenzl in Endl., Enum. Pl. 23 (1837). **Type:** “New South Wales”, *A. Cunningham* (?W, *n.v.*).

Shrub 0.6–1 m high, lateral branchlets 1–3 cm long, not terminating in a spine. Young branchlets with simple adpressed hairs overlying small stellate hairs. Older branches glabrescent. Stipules connate on lower side of petiole, persistent, narrowly triangular, 1.0–1.5 mm long. Leaves often in fascicles (1–5 per node), petioles 0.2–0.3 mm long; lamina terete, ellipsoidal, 1.2–3.5 mm long, 0.4–0.7 mm wide, 2.5–7 times longer than broad, apex obtuse, margins strongly revolute; upper surface green, glabrous, sometimes muricate; lower surface (rarely visible) white, indumentum dense throughout, with simple hairs overlying small stellate hairs. Inflorescences 1- flowered, anthopodia 0.3–0.6 mm long; floral bracts c. 15, ovate to elliptical, inner ones 2.9–3.8 mm long, brown, outer surface glabrous, apex acute, margin with cilia 0.1–0.2 mm long. Calyx white; calyx tube campanulate, 2.0–2.3 mm long, indumentum sparse throughout, with small stellate hairs only, 100% of tube obscured by bracts at anthesis; calyx lobes erect, 1.8–2.7 mm long, indumentum dense throughout, with simple adpressed hairs overlying small stellate hairs, lobes partially obscured by bracts at anthesis. Petals hooded, white, protruding 0.2–0.5 mm beyond calyx tube. Disc densely stellate hairy, obscurely 10-lobed. Style 1.0–3.3 mm long, glabrous throughout or stellate-hairy on lower half, stigma 3-lobed. Schizocarps broadly ellipsoidal, 2.8–4 mm long, 3-locular, ovary roof with sparse stellate indumentum, disc forming a narrow densely stellate-hairy annulus at the base of the persistent calyx, mericarps dehiscent by a ventral slit. Seeds not seen.

***Selected specimens*: Queensland.** Warrego District: near Bouden's Dam, Chesterton Range N.P., Aug 2001, *Dollery* 280 (BRI).Maranoa District: Mt Moffatt N.P., fire monitoring site 5, May 1997, *Addicott* MM45 (BRI). Leichhardt District: Planet Downs Pastoral holding, adjacent to Planet Creek, Mar 1998, *Brushe* JB1518 (BRI). Burnett District: S.F. 132, 9 km ESE of Brovinia, Jun 1997, *Bean* 12037 (BRI). Darling Downs District: Cecil Plains, Jun 1962, *Hockings s.n.* (BRI).

***Distribution and habitat*:** Widespread from Springsure to Inglewood, and west to Morven (**Map 1**). It is also widespread in New South Wales. It grows on sandy soils derived from sandstone.

***Phenology*:** Flowers recorded from June to September, with one record in December.

9. Cryptandra rigida A.R.Bean **sp. nov.** affinis C. propinquae Fenzl sed ramulis pilis stellatis tantum praeditis, habitu rigido invenusto, bracteis floralibus obtusis interioribus sub anthesi totum calycis tubi haud tegentibus et calycis tubo maximam partem glabro differens. **Typus:** Queensland. Burnett District: "Cooya", west of junction of Barambah and Boonara Creeks, 17 July 1996, *P. Grimshaw* 2486 & *R. Price* (holo: BRI; iso: MEL).

Cryptandra sp. (Ngungun L.S. Smith 13973) in Bean (2002).

Shrub 0.4–1 m high, lateral branchlets 1–2.5 cm long, not terminating in a spine. Young branchlets with small stellate hairs only. Older branches glabrescent. Stipules connate on lower side of petiole, persistent, narrowly triangular, 0.9–1.6 mm long. Leaves in fascicles (2–6 per node), petioles 0.2–0.5 mm long; lamina terete, ellipsoidal to lanceolate, 1.7–3.0 mm long, 0.4–0.9 mm wide, 2.5–6 times longer than broad, apex obtuse, margins strongly revolute; upper surface green, glabrous; lower surface (rarely visible) white, indumentum dense throughout, with simple hairs overlying small stellate hairs. Inflorescences 1- flowered, anthopodia 0.3–0.5 mm long; floral bracts c. 10, elliptical, inner ones 2.1–2.3 mm long, brown, outer surface glabrous, apex obtuse, margin with cilia 0.1–0.15 mm long. Calyx white; calyx tube cylindrical, 1.8–2.3 mm long, glabrous except for a few stellate hairs near the lobes, 50–90% of tube obscured by bracts at anthesis; calyx lobes erect, 1.6–2.0 mm long, indumentum rather sparse throughout, predominantly small stellate hairs with a few simple adpressed hairs. Petals hooded, white, protruding 0.5–0.8 mm beyond calyx tube. Disc densely stellate hairy, obscurely lobed. Style 2.5–2.7 mm long, glabrous throughout, stigma entire. Schizocarps broadly ellipsoid, 2.3–2.6 mm long, 3-locular, 50% inferior, ovary roof with sparse stellate indumentum, disc forming a narrow densely stellate-hairy annulus at the base of the persistent calyx, mericarps dehiscent by a ventral slit. Seeds flattened, elliptical in outline, 1.4–1.5 mm long excluding aril. Aril white, terminal. **Fig. 4.**

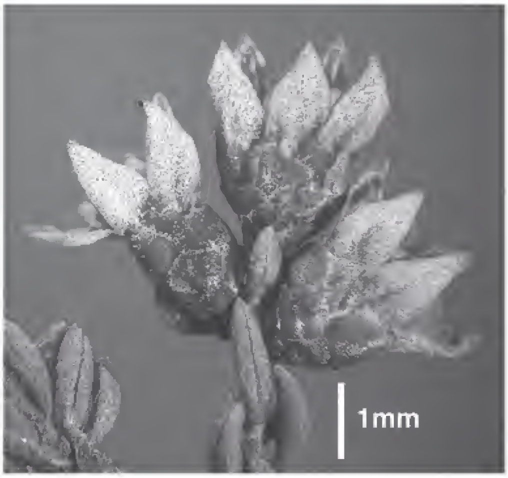


Fig. 4. ***Cryptandra rigida*.** A. flowering branchlet (*Grimshaw* 2486 & *Price*).

***Selected specimens*: Queensland.** Burnett District: Mt Lorna, 3 km W of Toondahra HS, Aug 1988, *Forster* 4637 (BRI, CANB); Campbell Creek, W of Mt Brian, Nov 1996, *Grimshaw* 2621 & Turpin (BRI). Wide Bay District: 1.5 km SSW of Biggenden Bluff, Mt Walsh N.P., Sep 2002, *Bean* 19229 (BRI) Moreton District: Ngungun, NE corner below summit basin, Jul 1968, *Smith* 13973 (BRI).

***Distribution and habitat*:** Known from several rhyolitic or granitic mountains in the far south east of Queensland (**Map 1**).

***Phenology*:** Flowers recorded from July to September; fruits in November.

***Affinities*:** *Cryptandra rigida* is clearly related to *C. propinqua*, from which it differs by the branchlets having stellate hairs only (vs. simple + stellate); the rigid unattractive habit; the obtuse inner floral bracts 2.1–2.3 mm long, not covering whole of calyx tube at anthesis (vs. acute inner floral bracts 2.9–3.8 mm long, covering all of calyx tube and partly covering calyx lobes); the mostly glabrous calyx tube; and the predominantly stellate indumentum of the calyx lobes.

***Etymology*:** the epithet refers to the rigid branchlets, that make field encounters with the species somewhat unpleasant.

10. Cryptandra ciliata A.R. Bean **sp. nov.** affinis C. propinquae Fenzl sed folia conspicue fasciculatis 4–11 per nodum, bracteis pallidis brunneis obtusis, marginibus bracteae ciliis 0.4–0.6 mm praeditis, et calycis tubo glabro differens. **Typus:** Queensland. LEICHHARDT DISTRICT: 28 km from Cracow on Nathan Gorge road, 15 July 1990, *P.I. Forster* PIF7037 (holo: BRI; iso: AD, CANB, K, MEL, NSW, *distribuendi*).

Cryptandra sp. (Gurulmundi G.W. Althofer 8418) in Bean (2002)

Cryptandra sp. 1, in Briggs & Leigh (1996)

Shrub to 0.5 m high, lateral branchlets 10–50 mm long, not terminating in a spine. Young branchlets with simple adpressed hairs overlying small stellate hairs. Older branches glabrescent. Stipules connate on lower side of petiole, persistent, triangular with slender apex, 1.3–1.8 mm long. Leaves in fascicles (usually 4–11 per fascicle), petioles 0.1–0.2 mm long; lamina terete, linear, 1.7–2.6 mm long, 0.4–0.5 mm wide, 4–5.5 times longer than broad, apex obtuse, margins strongly revolute; upper surface green, glabrous, sometimes muricate; lower surface (rarely visible) white, with dense stellate hairs and simple hairs. Inflorescences 1-flowered, anthopodia 0.5–0.8 mm long; floral bracts c. 13, obovate, inner ones 1.7–2.1 mm long, pale brown, apex obtuse, margin with cilia 0.4–0.6 mm long. Calyx white to brown; calyx tube campanulate, 1.8–2.0 mm long, glabrous except adjacent to calyx lobes, 100% of tube obscured by bracts at anthesis; calyx lobes erect to spreading, 1.4–1.7 mm long, with dense white simple hairs. Petals hooded, white, protruding 0.5–0.6 mm beyond calyx tube. Disc densely stellate hairy, obscurely 10-lobed. Style 0.7–1.2 mm long, glabrous throughout, stigma entire. Schizocarps ellipsoidal, 3-locular, 2.4–2.9 mm long, 50–65% inferior, ovary roof with sparse stellate indumentum, disc forming an annulus of dense stellate hairs at the base of the persistent calyx, mericarps dehiscent by a ventral slit. Seeds flattened, oblong in outline, 1.8–1.9 mm long excluding aril. Aril white, terminal. **Fig. 5.**

***Selected specimens*:** **Queensland.** LEICHHARDT DISTRICT: Cracow–Taroom road, S of "Fairyland", Sep 1990, *Bean* 2302 (BRI); Gwambegwine, Ruined Castle Creek catchment, Sep 1996, *Forster* 19653 (BRI); 16 km SSW of Cracow township, Jul 1963, *Lazarides* 6948 (BRI).

***Distribution and habitat*:** *C. ciliata* is sporadically distributed from Barakula State Forest to west of Theodore (**Map 1**). It grows on sandstone ridges and slopes in eucalypt woodland.

***Phenology*:** flowers and fruits recorded from July to September.

***Affinities*:** *Cryptandra ciliata* is allied to *C. propinqua* but differs the conspicuously fasciculate leaves with 4–11 per node, the pale brown obtuse bracts up to 2.1 mm long (vs. dark brown, acute, 2.9–3.8 mm long for *C. propinqua*), bract cilia 0.4–0.6 mm long (vs. 0.1–0.2 mm long), calyx tube 1.4–1.7 mm long, glabrous (vs. 1.8–2.7 mm long, stellate hairy) and calyx lobes with simple adpressed hairs (vs. simple and stellate).

***Etymology*:** the epithet refers to the conspicuously ciliate bracts, which serve to distinguish it from other Queensland species.

11. Cryptandra gemmata A.R. Bean **sp. nov.** Folia 0.8–1.1 mm longa, inflorescentiae terminales cymosaeque, 3–5-florae, alabastra in axillis bractearum plurimarum, bracteae apex aristatus, discus floralis annularis dense pilosus, mericarpia dehiscentia. **Typus:** Northern Territory. Arnhem Land, 19 km E of Jabiru, 18 April 1989, *R.W. Johnson* 4552 (holo: BRI; iso: AD, BISH, CONN, DNA, MEL, NSW, *distribuendi*).

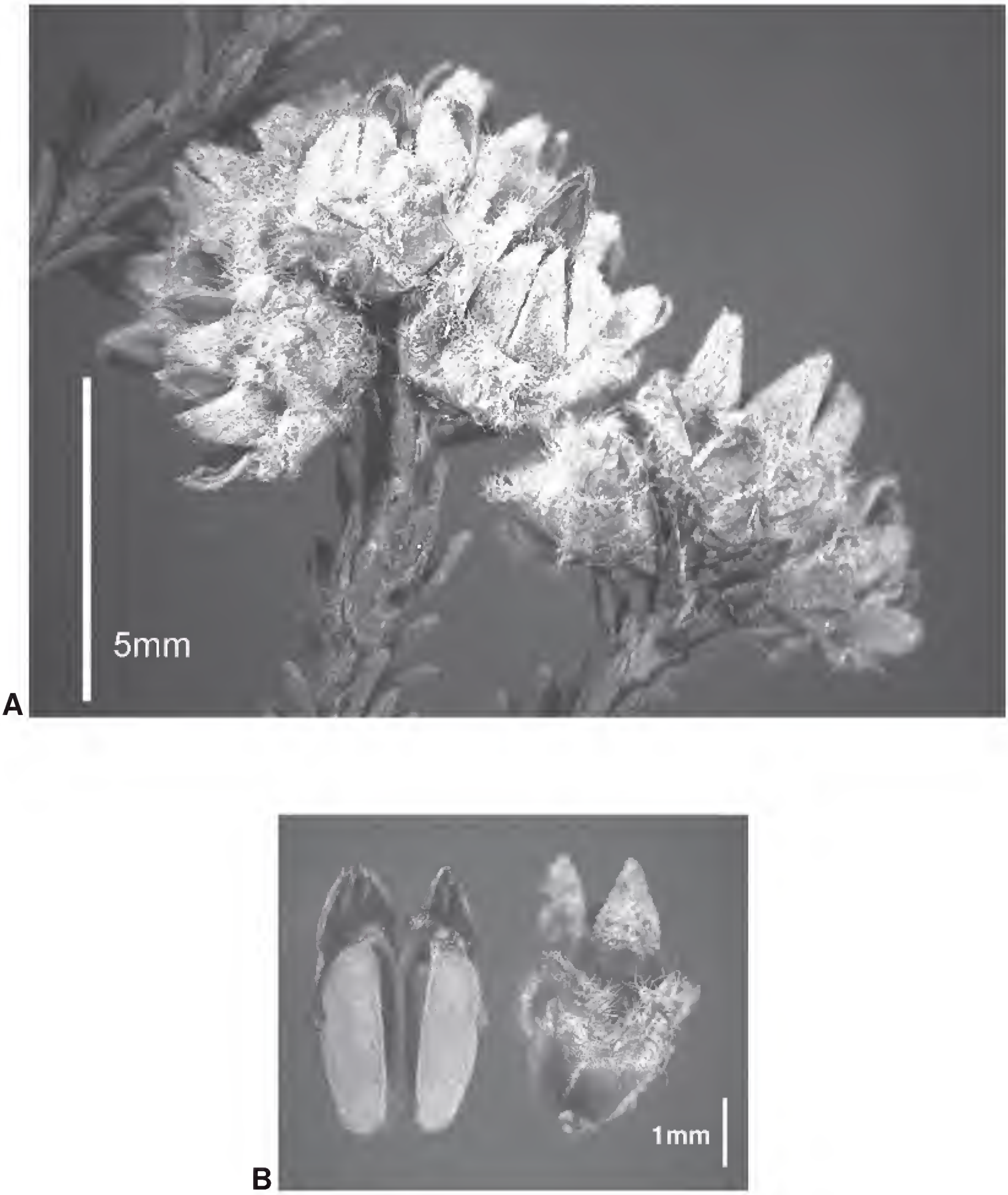


Fig. 5. ***Cryptandra ciliata***. A. flowering branchlet, showing revolute leaves and ciliate bracts (*Forster* 7037); B. schizocarp, showing persistent bracts and calyx, and dehiscent mericarps (*Forster* 19668).

Shrub 0.2–0.3 m high, lateral branchlets 1–3 cm long, not terminating in a spine. Young branchlets with small stellate hairs only. Older branches glabrescent. Stipules connate on lower side of petiole, persistent, narrowly triangular with slender apex, 1.0–1.3 mm long. Leaves in fascicles (3–9 per node), petioles absent; lamina terete, ellipsoidal, 0.8–1.1 mm long, 0.3–0.4 mm wide, 2.5–3.5 times longer than broad, apex obtuse, margins revolute; upper surface green, glabrous, muricate; lower surface (rarely visible) white, densely hairy. Inflorescences cymose, 3–5 flowered, clustered at very end of branchlets; anthopodia 0–0.2 mm long, floral bracts several (3 or 4 fertile bracts and 2 sterile), elliptical but with an aristate apex, 1.9–2.2 mm long, brown, outer surface glabrous, margin entire or with tiny cilia <0.1 mm long. Calyx white to creamy; calyx tube cylindrical to urceolate, 1.6–1.7 mm long, with dense small stellate hairs and scattered adpressed simple hairs, 50–100% of tube obscured by bracts at anthesis; calyx lobes erect, 0.8–1.0 mm long, with the same indumentum as the tube. Petals hooded, white, protruding 0.5–0.6 mm beyond calyx tube. Disc densely stellate hairy, obscurely lobed. Style 1.2–1.6 mm long, glabrous throughout, stigma entire. Schizocarps obovoid, 3-locular, 2.5–2.9 mm long, 60–70% inferior, ovary roof sparsely stellate hairy, disc forming a narrow densely stellate-hairy annulus at the base of the persistent calyx, mericarps dehiscent by a ventral slit. Seeds flattened, elliptical in outline, 1.8–2.0 mm long excluding aril. Aril white, terminal. **Fig. 6.**

***Additional specimen*: Northern Territory.** Arnhem Land, 19 km E of Jabiru, Apr 1989, *Johnson* 4618 (AD, BRI, DNA, MEL, NSW).

***Distribution and habitat*:** Known only from the far north of the Northern Territory, near Jabiru. It inhabits shrubland on sandstone pavement, with little or no soil.

***Phenology*:** flowers and fruits recorded for April.

***Affinities*:** *Cryptandra gemmata* is a distinctive species with no obvious allies. The leaves are only 0.8–1.1 mm long, and the bracts have an aristate apex. Most significantly, the inflorescences appear to be truly terminal, and cymose. Each flower is surrounded by several bracts, of which only two are sterile; the remainder subtend flower buds and have the potential to form new flowers. Hence it is common to see various aged buds, flowers and fruits on the same inflorescence.

***Etymology*:** The epithet is from the Latin *gemmatus*, meaning 'provided with buds, budded'. This refers to the development of buds around the existing flowers and fruits on the inflorescences.

12. Cryptandra pogonoloba A.R.Bean **sp. nov.** ab omnibus aliis speciebus queenslandicis stipulis in pagina superiore petiolorum positis, bracteis floralibus apice aristato ornatis et pilis longis simplicibus erectis ad apicem calycis lobi differens. **Typus:** Queensland. Cook District: Bulleringa National Park, 80 km north-west of Mt Surprise, Red River area, 23 April 1998, *P.I. Forster* PIF22542 & *R. Booth* (holo: BRI; iso: DNA, K, MEL, NSW, QRS, *distribuendi*).

Shrub 0.5–1 m high, lateral branchlets 0.3–1 cm long, not terminating in a spine. Young branchlets with small stellate hairs only. Older branches glabrescent. Stipules overlapping but not connate on upper side of petiole, persistent, triangular to ovate, with slender apex, 1.7–2.0 mm long. Leaves not in fascicles (1 per node), petioles 0.3–0.9 mm long; lamina linear to oblanceolate, 4.0–8.5 mm long, 0.8–1.2 mm wide, 4.5–9 times longer than broad, apex obtuse or acute, margins revolute; upper surface grey, densely hairy, with stellate hairs or short simple hairs; lower surface white, with dense stellate hairs throughout and some simple hairs along midrib. Inflorescences 1- flowered, anthopodia absent; floral bracts several, identical to stipules but larger, inner ones 2.0–2.3 mm long, brown, glabrous except for a few simple hairs along midrib, apex aristate, margin with cilia 0.3–0.6 mm long. Calyx white to creamy; calyx tube ovoid to ellipsoid, 0.7–0.8 mm long, with dense small stellate hairs throughout, bract apices 70–100% length of tube, only base of tube obscured; calyx lobes erect, 1.0–1.2 mm long, with dense stellate hairs throughout and long erect simple hairs, especially towards apex. Petals hooded, white, protruding 0.2–0.4 mm beyond calyx tube. Disc

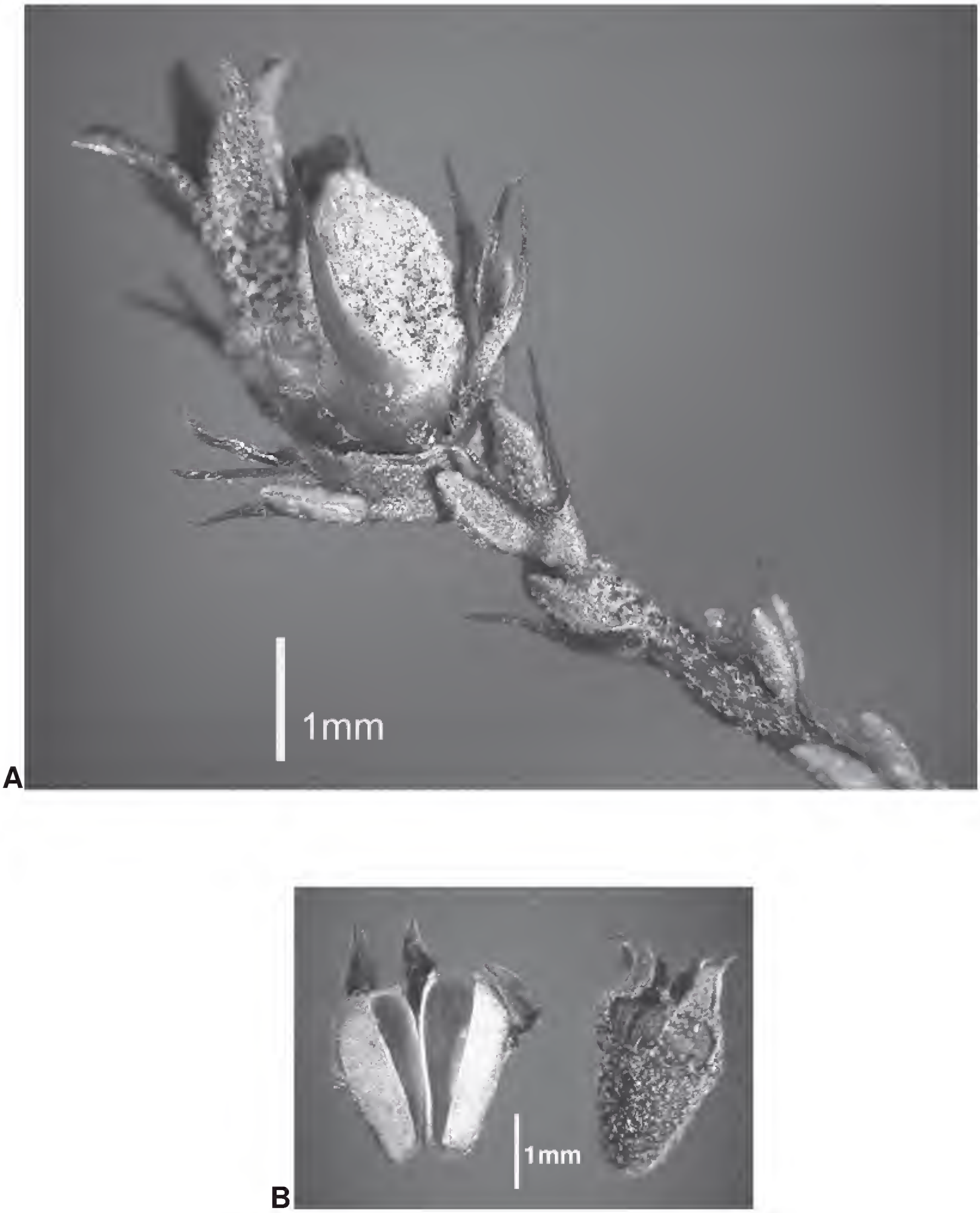


Fig. 6. ***Cryptandra gemmata***. A. branchlet, showing fasciculate leaves and prominent stipules (*Johnson* 4552); B. schizocarp, showing persistent calyx and dehiscent mericarps (*Johnson* 4552).

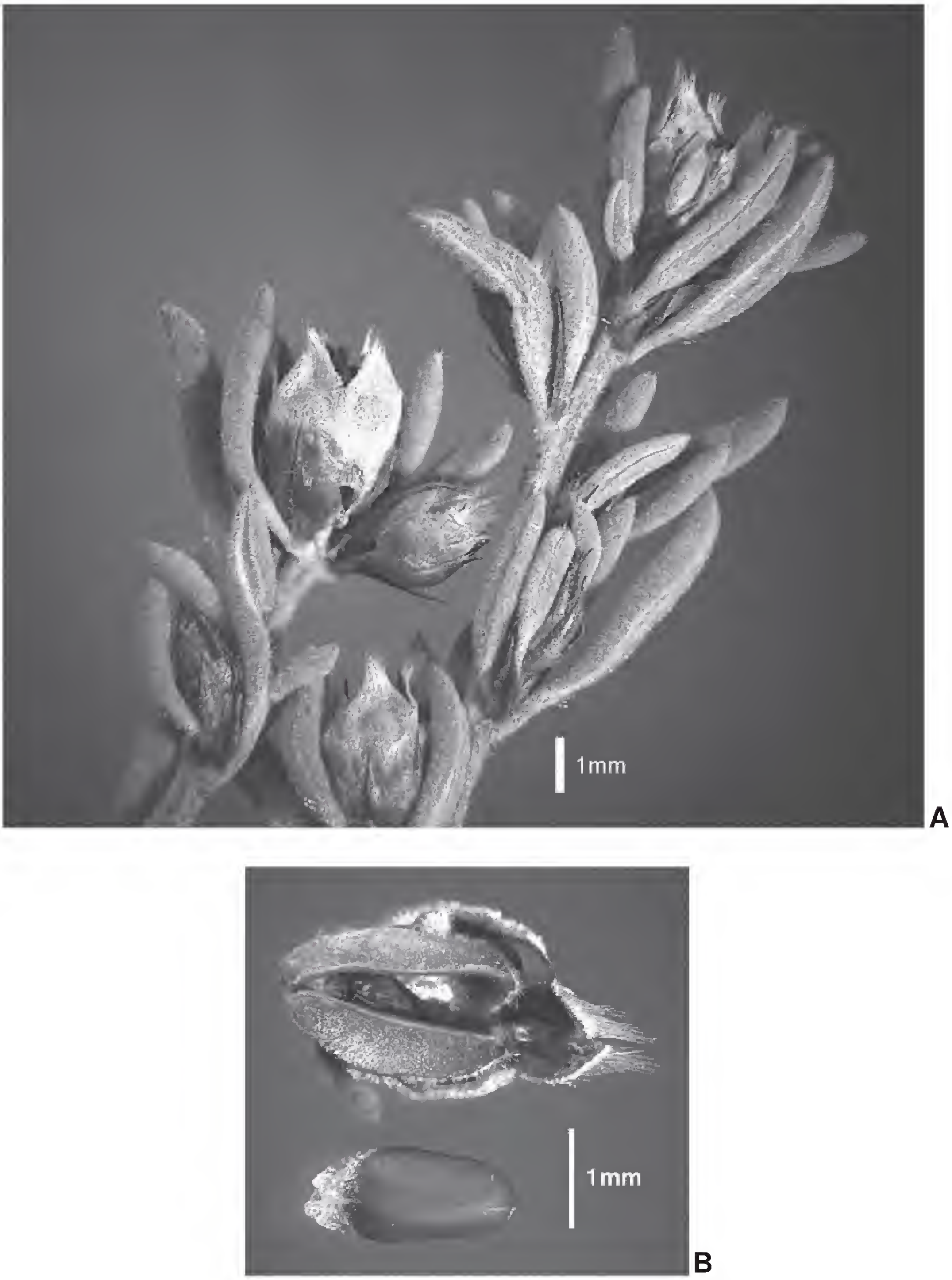


Fig. 7. ***Cryptandra pogonoloba***. A. flowering branchlet (*Forster* 22542); B. dehisced mericarp, showing long erect hairs on calyx, and seed (*Forster* 22608).

densely stellate hairy, lobing obscure. Style 0.6–0.8 mm long, glabrous, stigma entire. Schizocarps ellipsoidal, 3-locular, 2.1–2.4 mm long, 60–70% inferior, ovary roof densely stellate-hairy, disc forming a narrow densely stellate-hairy annulus at the base of the persistent calyx, mericarps dehiscent by a ventral slit. Seeds flattened, elliptical in outline, 1.6–1.9 mm long excluding aril. Aril white, terminal. **Fig. 7.**

Selected specimens: **Queensland.** Cook District: 54 km along Bulimba Station road, off Chillagoe–Wrotham Park road, Jun 1991, *Forster* PIF8438 (AD, BRI, MEL); Bulleringa N.P., 80 km NW of Mt Surprise, Apr 1998, *Forster* PIF22608 & *Booth* (BRI); ditto, *Forster* PIF22642 & *Booth* (BRI, DNA, MEL); ditto, Forster PIF22689 & *Booth* (BRI, DNA, MEL, NSW, QRS).

Distribution and habitat**:** *Cryptandra pogonoloba* is confined to north Queensland, in the area north of Georgetown and west of Chillagoe (**Map 1**). It grows on sandstone ridges and slopes in eucalypt woodland.

Phenology**:** Flowers and fruits are recorded for April and June.

Affinities**:** *C. pogonoloba* differs from all other Queensland species by the stipules placed on the upper side of the petiole, the floral bracts with an aristate apex and the long erect simple hairs at the apex of the calyx lobes. The upper leaf surface is densely stellate-hairy, a feature shared only by *C. filiformis*.

Etymology**:** the epithet refers to the conspicuous erect simple hairs on the apex of the calyx lobes (Gk. *pogon* - beard, and *lobus* - lobe).

13. Cryptandra filiformis A.R.Bean **sp. nov.** ab omnibus aliis speciebus a Queenslandia cognitis inflorescentia cymosa, absentia bractearum floralium et stipulis filiformibus differens. **Typus:** Queensland. Cook District: Mt Carbine to Maytown, 46 km along Whites Creek road, 20 April 2002, *A.R. Bean* 18766 & *K.R. McDonald* (holo: BRI; iso: CANB, MEL, NSW).

Shrub 0.5–0.7 m high, without distinct lateral branchlets, not spinose. Young branchlets with small stellate hairs only. Older branches stellate hairy. Stipules connate on lower side of petiole, persistent, thread-like, 2.8–4.4 mm long, stellate-hairy throughout. Leaves not in fascicles (1 per node), petioles 0.5–0.8 mm long; lamina narrowly elliptic to narrowly lanceolate, 7.5–30 mm long, 0.9–3.5 mm wide, 5–9 times longer than broad, apex acute, margins recurved to revolute; upper surface grey, with dense stellate hairs only; lower surface white, with dense stellate hairs only. Inflorescences 2–11- flowered, cymose; anthopodia 0.7–1.2 mm long; floral bracts absent. Calyx white to creamy; calyx tube cylindrical to urceolate, 1.0–1.3 mm long, with dense small stellate hairs throughout; calyx lobes erect, 1.1–1.3 mm long, with dense stellate hairs throughout. Petals hooded, white, protruding 0.4–0.5 mm beyond calyx tube. Disc densely stellate hairy, 5-lobed. Style 1.6–1.8 mm long, stellate hairy on proximal one-third, otherwise glabrous, stigma entire. Schizocarps obovoid, 3-locular, 3.0–3.8 mm long, 60–70% inferior, ovary roof stellate-hairy, disc forming a narrow densely stellate-hairy annulus at the base of the persistent calyx, mericarps dehiscent by a ventral slit. Seeds flattened, ellipsoidal, 2.2–2.4 mm long excluding aril. Aril white, terminal. **Fig. 8.**

Selected specimens**:** **Queensland.** Cook District: 23 km E of Forsayth on road to Einasleigh, Oct 2000, *Addicott* EPA851 & *Newton* (BRI); near Groganville, N of Chillagoe, Apr 2002, *Bean* 18754 & *McDonald* (BRI); 26 km W of Einasleigh on road to Forsayth, on top of Newcastle Range, Apr 1992, *Halford* Q957 (BRI).

Distribution and habitat**:** *C. filiformis* is known from two areas of north Queensland about 250 kilometres apart - on the Newcastle Range (W of Einasleigh), and in the Maytown–Groganville area (**Map 3**). These populations are apparently disjunct. It grows on ridges and plateaux on metamorphics or lateritised sandstone.

Phenology**:** Flowers are recorded for April; fruits in October.

Affinities**:** *Cryptandra filiformis* differs from all other Queensland species by the thread-like stipules, the complete absence of simple hairs, the cymose inflorescence, and the absence of floral bracts. It seems most closely related to *C. intratropica* W.Fitzg., a species from the Kimberley region of Western Australia, which also has strictly stellate indumentum,

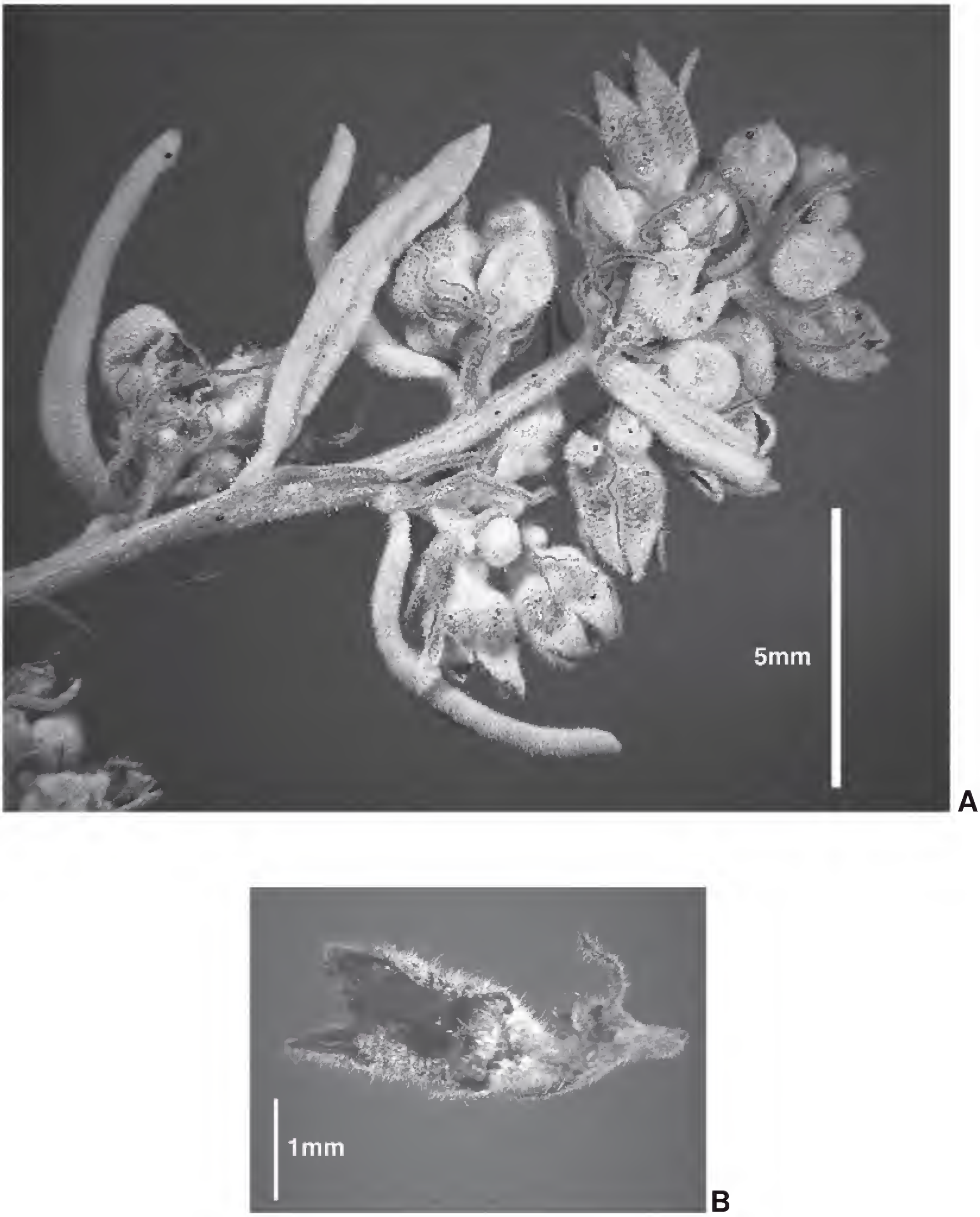


Fig. 8. ***Cryptandra filiformis***. A. flowering branchlet, showing revolute leaves and filiform stipules (*Bean* 18766); B. half-flower, showing stellate-hairy disc and glabrous style (*Bean* 18766).

rudimentary bracts and a contracted cymose inflorescence. While these characteristics are unusual in *Cryptandra*, both *C. filiformis* and *C. intratropica* display enough typical *Cryptandra* character states (e.g. the annular stellate-hairy disc, the conspicuous calyx tube and the dehiscent mericarps) for them to be regarded as members of *Cryptandra*.

Etymology: the epithet refers to the slender thread-like stipules.

14. Stenanthemum argenteum A.R.Bean **sp. nov**. affinitate ad *S. leucophractum* (Schltdl.) Reissek, sed statura majore, partibus hornotinis argenteis, foliis longioribus, bracteis floralibus aristatis et calycis tubo pilos et simplices et stellatos ferenti differens. **Typus:** Queensland. Cook District: The Pepperpot, Mount Mulligan, c. 40 km NW of Dimbulah, 31 May 1985, *J.R. Clarkson* 5949 (holo: BRI; iso: L, MEL, MO, NSW, *distribuendi*).

Cryptandra sp. (Mt Mulligan J.R. Clarkson 5949) in Bean (2002).

Cryptandra sp. 2, in Briggs & Leigh (1996).

Shrub c. 2 m high, without distinct lateral branchlets, not spinose. Young branchlets with simple adpressed hairs only. Older branches remaining hairy. Stipules on upper side of petiole, not connate but sometimes overlapping, persistent, very narrowly triangular with slender apex, 2.0–3.1 mm long. Leaves solitary, not in fascicles, petioles 2–3 mm long; lamina oblanceolate to obovate, 7.5–16 mm long, 2.0–4.9 mm wide, 2.5–4.5 times longer than broad, apex acute or obtuse, lamina flat or margins incurved; upper surface green, glabrous; lower surface white, with dense adpressed simple hairs throughout. Inflorescences c. 7- flowered, in a terminal head, surrounded by c. 3 bi-aristate stipule-like bracts, and 1 or 2 spathulate floral leaves that are densely hairy on both surfaces. Flowers without anthopodia; floral bracts 2 or 3, elliptical, 2.7–3.0 mm long, brown, outer surface glabrous except along midrib, apex obtuse, margin with cilia 0.2–0.25 mm long. Calyx white to creamy; calyx tube cylindrical to urceolate, 2.5–3.0 mm long, with mixture of long simple hairs and minute stellate hairs, 80–100% of tube obscured by bracts; calyx lobes erect, 1.9–2.0 mm long, with long simple adpressed hairs throughout. Petals hooded, white, protruding 1.1–1.4 mm beyond calyx tube. Disc not apparent. Style c. 3.3 mm long, glabrous throughout, stigma entire. Schizocarps and seeds not seen. **Fig. 9.**

***Additional specimen*: Queensland.** Cook District: Mt Mulligan, c. 40 km NW of Dimbulah, Apr 1985, *Clarkson* 5765 (BRI).

***Distribution and habitat*:** Known only from Mt Mulligan, in north-eastern Queensland (**Map 1**). It grows on sandstone pavement in heathland.

***Phenology*:** Flowers are recorded for May.

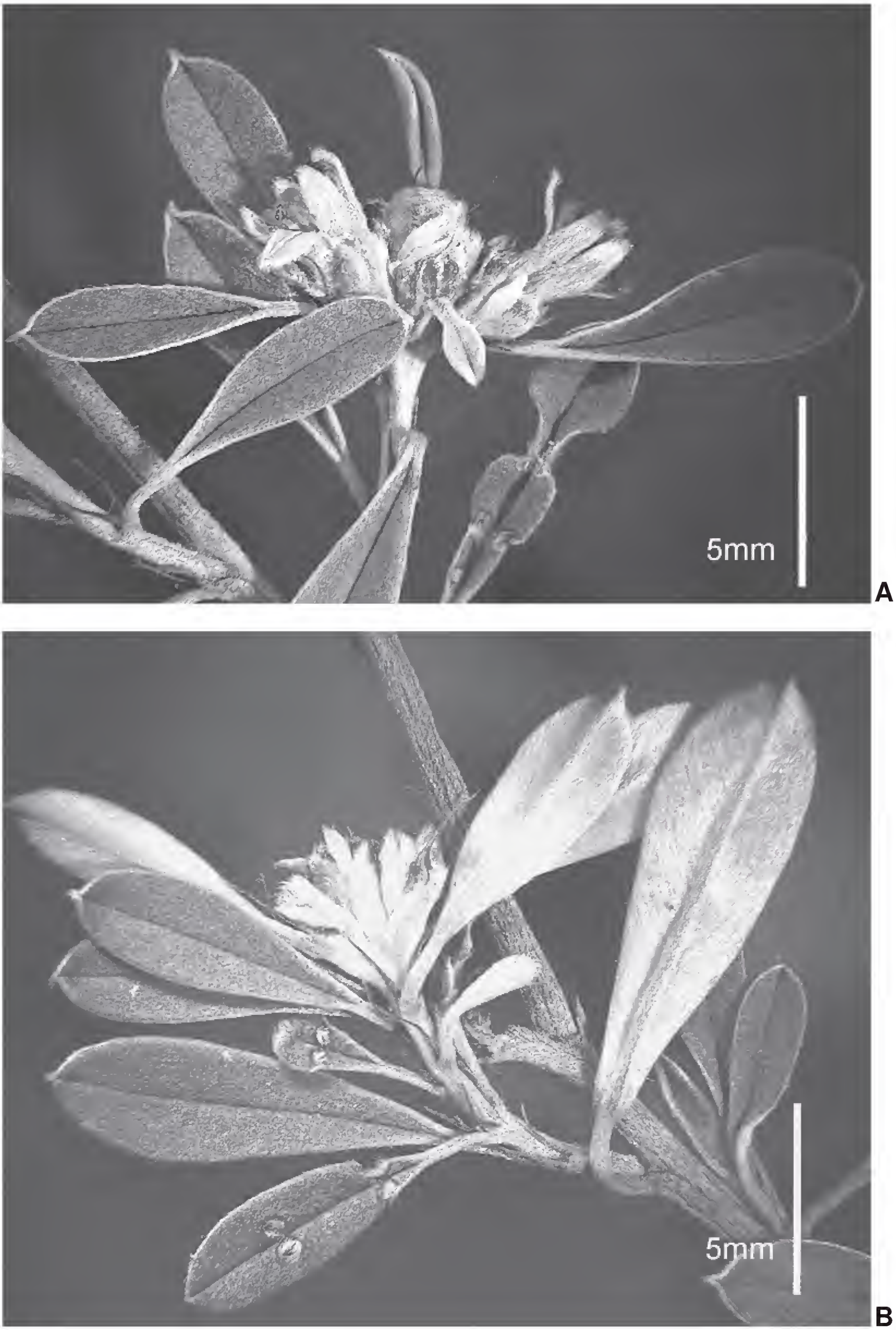
***Notes*:** *S. argenteum* is similar to *S. leucophractum*. Both species have petiolate, obovate leaves, stipules united above the petiole, a head-like inflorescence with 1 or 2 specialised floral leaves, and the disc obscure and glabrous. However, *S. argenteum* differs by the greater stature, the silvery new growth, the longer leaves, the aristate floral bracts, and the calyx tube with a mixture of simple and stellate hairs.

***Conservation status*:** *S. argenteum* is currently known only from Mt Mulligan. It is threatened by its small population size and restricted area of occupancy. Applying the IUCN guidelines (IUCN. 2001), a category of “Vulnerable” is recommended (VU D1+2).

***Etymology*:** The epithet refers to the silvery branchlets and leaves (L. *argenteus* - silvery).

15. Stenanthemum scortechinii (F.Muell.) Maiden & Betche, Proc. Linn. Soc. New South Wales 27: 57 (1902); *Cryptandra scortechinii* F.Muell., Australas. Chem. Druggist 6 (69): 72 (1884). **Type**: on the Severn [River], undated, *B. Scortechini* (holo: ?MEL, *n.v.*).

Shrub 0.3–1 m high, lateral branchlets 1–8 cm long, not spinose. Young branchlets with dense stellate hairs only. Older branches remaining hairy. Stipules on upper side of petiole, not connate but overlapping, persistent, triangular, 2.2–3.8 mm long. Leaves solitary, not in fascicles, petioles 1–1.9 mm long; lamina lanceolate, 5–14 mm long, 1.7–3.9 mm wide, 3–6 times longer than broad, apex acute or mucronate, margins recurved to revolute; upper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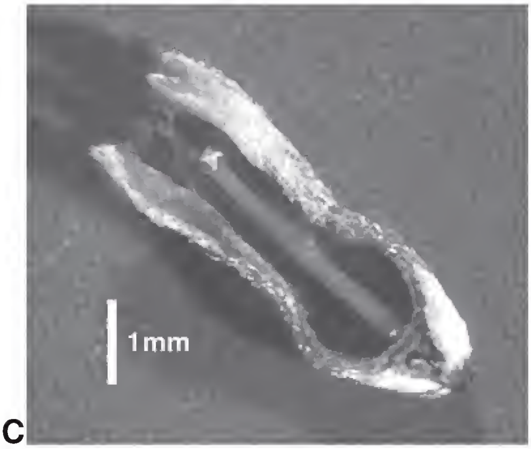

Fig. 9. ***Stenanthemum argenteum***. A. flowering branchlet showing inflorescence with a single floral leaf (*Clarkson* 5949); B. flowering branchlet, showing stipules and silvery lower leaf surface (*Clarkson* 5949); C. half-flower, showing glabrous style and lack of obvious disc (*Clarkson* 5949).

surface green, glabrous; lower surface white, with dense stellate hairs throughout and scattered simple hairs along midrib. Inflorescences compound, each terminal 'head' comprising 5–6 shortly pedunculate clusters of c. 6 flowers, each surrounded by very dense mass of simple long woolly hairs. Clusters subtended by 2 outer + 3 or 4 inner, orbicular bracts, up to 5 mm long, brown, outer surface glabrous except for simple and stellate hairs along midrib, apex acute, margin entire. Calyx white; calyx tube cylindrical, 0.9–1.0 mm long, glabrous; individual flowers not subtended by bracts; calyx lobes erect, 0.9–1.0 mm long, with long simple hairs and small stellate hairs. Petals hooded, white, protruding c. 0.6 mm beyond calyx tube. Disc not apparent. Style 0.8–1.2 mm long, glabrous throughout, stigma entire. Schizocarps ellipsoidal, 3-locular, 2.7–3.0 mm long, 90% inferior, ovary roof stellate-hairy, mericarps indehiscent, chartaceous. Seeds flattened, ellipsoidal, 1.9–2.0 mm long. Aril absent.

Selected specimens**: Queensland.** Darling Downs District: upper reaches of Bald Rock Creek, Girraween N.P., Sep 1993, *Bean* 6357 & *Forster* (BRI, CANB, MEL); Lyra, Nov 1959, *Blake* 21092 (BRI, CANB); Stanthorpe, Jul 1904, *Boorman s.n.* (BRI, NSW); 9 km NW of Ballandean, Murphys Ck, Portion 91 Tartini Pty Ltd, Dec 1994, *Halford* Q2363 (BRI); slopes near summit of Mt Norman, Sep 1977, *Powell & Armstrong s.n.* (BRI, NSW).

Distribution and habitat**:** In Queensland, *S. scortechinii* is confined to the Stanthorpe district (**Map 1**), but is moderately widespread in New South Wales. It grows on lower slopes of hills in coarse sandy soils derived from granite, in eucalypt forest with a heathy understorey.

Phenology**:** Flowers and fruits recorded between September and December.

Notes**:** *S. scortechinii* has chartaceous, indehiscent mericarps. All other *Stenanthemum* species have dehiscent mericarps. Indehiscent mericarps are a regular feature of both *Trymalium* and *Spyridium*, but in those genera, the mericarps are very hard, thick and rugose.

Acknowledgements

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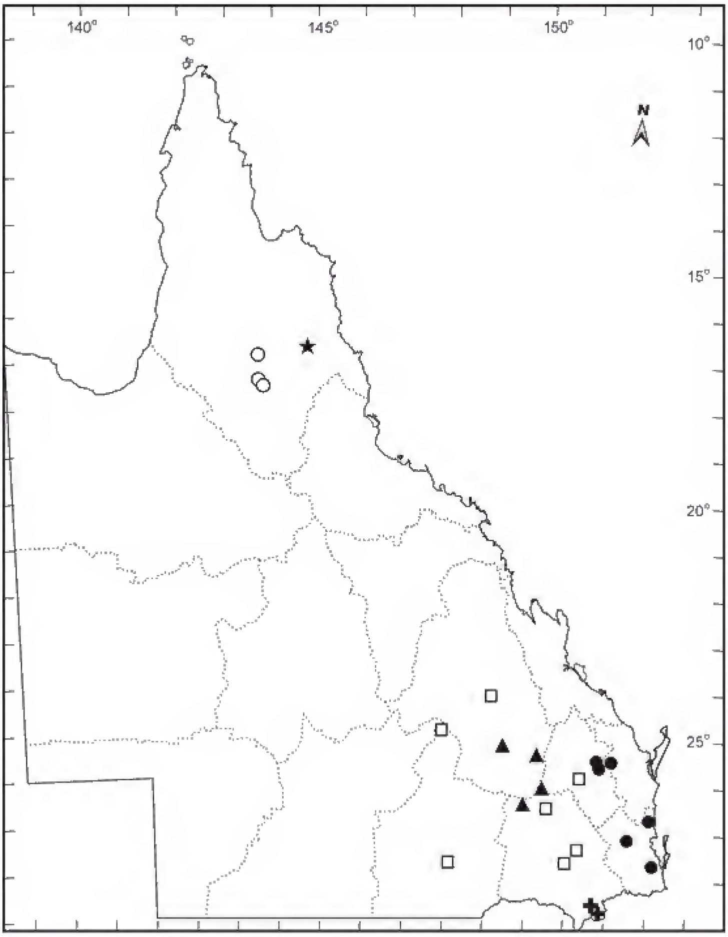
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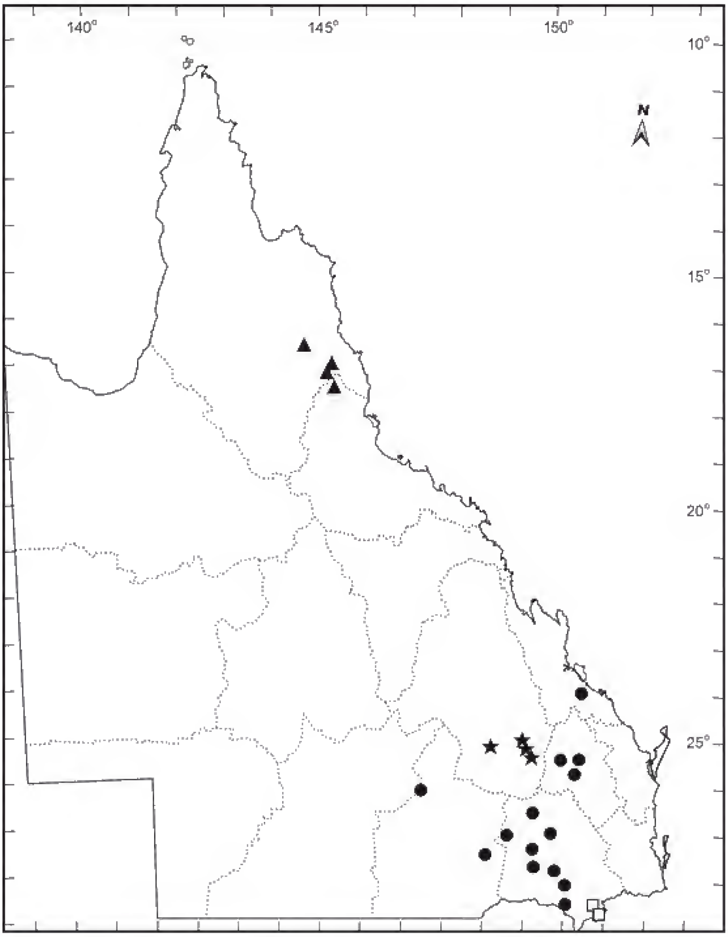
Map 1. Distribution of *Cryptandra propinqua* □ , *C. rigida* ● , *C. ciliata* ▲ , *C. pogonoloba* ○ , *Stenanthemum argenteum* ★ , *S. scortechinii* ✚ .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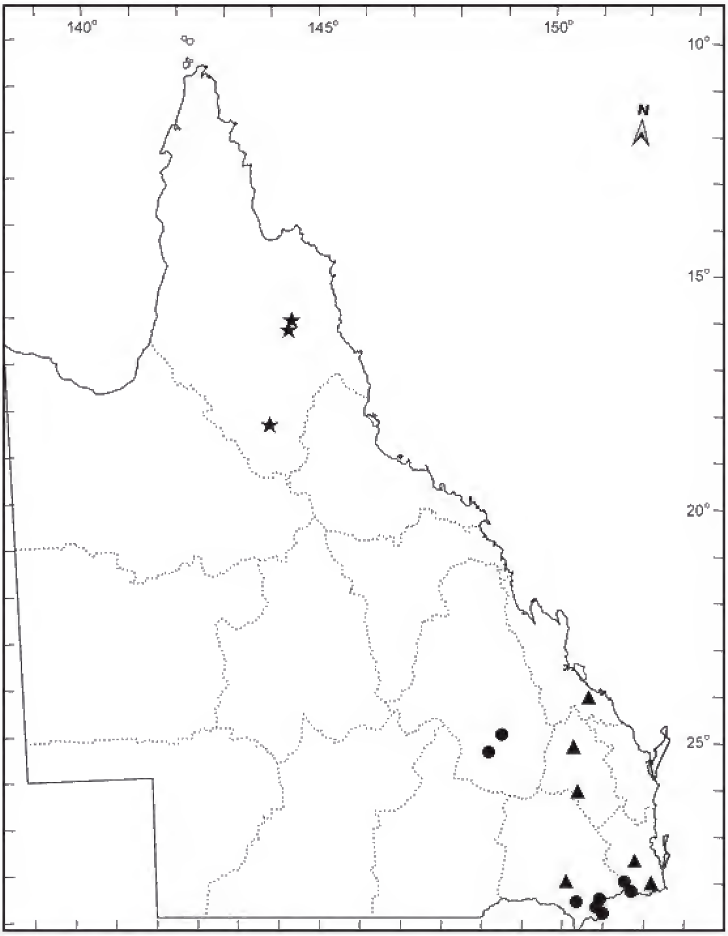
Map 2. Distribution of *Cryptandra debilis* ▲, *C. amara* var. *floribunda* □, *C. armata* ●, *C. orbicularis* ★.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Map3. Distribution of *Cryptandra amara* var. *amara* ● , *C. longistaminea* ▲ , *C. filiformis* ★ .

Rediscovery of *Tylophora linearis* P.I.Forst. (Apocynaceae: Asclepiadoideae) from New South Wales, with revision of its conservation status to vulnerable

Paul I. Forster, Doug Binns and Geoff Robertson

Summary

Forster, P.I., Binns, D. & Robertson, G. (2004). Rediscovery of *Tylophora linearis* P.I.Forst. (Apocynaceae: Asclepiadoideae) from New South Wales, with revision of its conservation status to vulnerable. *Austrobaileya* 6(4): 941–947. Newly discovered populations of *Tylophora linearis* (last collected in 1969) are documented from central New South Wales. An amplified description and diagnostic illustrations are provided. The conservation status of *Tylophora linearis* is reviewed with the recommendation that it be downgraded to Vulnerable. *Tylophora linearis* is newly recorded as a host-plant for the butterfly *Danaus chrysippus petilia*.

Keywords: *Tylophora linearis*; Queensland flora; New South Wales flora; Apocynaceae; Asclepiadaceae; *Danaus chrysippus petilia*; Vulnerable flora

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Introduction

Tylophora linearis P.I.Forst. was named in the most recent revision of this genus for Australia (Forster 1992). A further concise account of the species was provided in the 'Flora of Australia' (Forster 1996). Only four gatherings (including the type collection) have previously been made of *Tylophora linearis*, in 1913, 1915, 1960 and 1969. These four gatherings were all made from widely scattered localities in southern Queensland (near Glenmorgan) through to southern New South Wales (near Temora). The vegetation in all of these four localities has been greatly altered since these collection dates, and the species has been listed as Endangered under the Australian Commonwealth *Environment Protection and Biodiversity Conservation Act,* 1999 (*EPBC*), the Queensland *Nature Conservation Act*, 1994 (*NCA*) and the New South Wales *Threatened Species Conservation Act*, 1995 (*TSCA*). The paucity of adequate herbarium material for this species has meant that no detailed illustrations have been provided to date; an essential aid if rapid identification is to be achieved. This identification problem is compounded by the superficial similiarity of vegetative plants of *Rhyncharrhena linearis* (Decne.) K.L.Wilson and *Marsdenia viridiflora* R.Br.

A small number of populations of *Tylophora linearis* have been recently located in central New South Wales. This has enabled information to be gathered about extant distribution, abundance, habitat and phenological patterns. It has also enabled provision of an expanded morphological description, together with illustrations. A new assessment of the conservation status of *Tylophora linearis* is undertaken using the IUCN criteria (Anon. 2001).

Materials and Methods

This paper is based on herbarium collections at BRI and NSW, together with new collections by D. Binns and G. Robertson (deposited in BRI). The first of the new collections was made as a result of pre-harvest survey in Eura State Forest conducted as part of the standard survey requirement for logging in State forests in NSW. Although *Tylophora linearis* was one of the target species for survey, its discovery was partly serendipitous. Subsequently, on the premise that the species may exhibit

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synchronous flowering over a broader area, specific searches for flowering material were conducted elsewhere. Searches were conducted opportunistically in habitats in the Dubbo area similar to that at the Eura S.F. site, and at a selection of systematic flora survey sites in the Pilliga forests where vegetatively similar plants had been recorded previously. Most of these previous records were sight records, but some were based on vegetative vouchers held at State Forests of New South Wales herbarium at Coffs Harbour, NSW. Sites were selected for ease of access and to represent a relatively wide geographical spread. Opportunities were also taken to search for the species during other flora surveys being conducted at the time.

Taxonomy

Tylophora linearis P.I.Forst., Austral. Syst. Bot. 5: 31 (1992). **Type:** New South Wales. Temora, November 1915, *Dwyer* 802 (holo: NSW).

Herbaceous twiner to c. 2 m long, latex clear. Stems cylindrical, up to 3 mm diameter, glabrous or with scattered indumentum; internodes up to 100 mm long. Leaves petiolate; petioles 1–7 mm long, c. 0.5 mm diameter, channelled on top, with scattered to sparse indumentum, extrafloral nectaries absent from base. Leaf lamina linear-lanceolate, up to 100 mm long and 4 mm wide, glabrous or with scattered indumentum, ± concolorous, venation ± obscure, tip acute, base attenuate to cuneate, adaxial surface dark green, glabrous; abaxial surface dark to medium green, glabrous or with scattered indumentum. Cyme umbelliform, up to 20 mm long and with up to 6 flowers; peduncle cylindrical, up to 23 mm long and c. 0.5 mm diameter, glabrous or with scattered to sparse indumentum; bracts linear to linear-lanceolate, 1–3.5 mm long, 0.3–0.5 mm wide, glabrous or with scattered indumentum. Flowers 2–2.5 mm long, (6–) 18–22 mm diameter; pedicels (3–) 5–8 mm long, glabrous or with scattered indumentum. Sepals lanceolate to lanceolate-ovate, weakly apiculate, 1.5–2 mm long, 1–1.6 mm wide, glabrous, base of each sinus with 1 extrafloral nectary. Corolla rotate, externally olive-green, internally dark purple; tube 1–1.2 mm long, 1.5–2.8 mm diameter, glabrous; lobes lanceolate to lanceolate-ovate, 3.5–5.5 mm long, 1.7–2.5 mm wide, with short indumentum on internal surface that is more concentrated towards tip. Staminal corona 0.5–0.8 mm long, 1.5–2 mm diameter, purple, each lobe rounded to flat-topped, 0.5–0.8 mm long, 0.6–1.1 mm wide. Staminal column c. 1 mm long, 1–1.3 mm diameter; anther appendages truncate to elliptic, 0.4–0.5 mm long, 0.3–0.5 mm wide; alar fissure c. 0.2 mm long. Style-head pentagonal globose, 0.5–0.7 mm long, c. 1 mm diameter, green; ovaries c. 1 mm long and 1 mm diameter, glabrous. Pollinaria 0.2–0.3 mm long, 0.2–0.5 mm wide; pollinia globose, held horizontally to erect, 0.16–0.22 mm long, 0.12–0.18 mm wide; corpusculum oblong, 0.1–0.13 mm long, 0.04–0.05 mm wide; caudicles 0.05–0.1 mm long, c. 0.02 mm wide. Follicles fusiform, 95–100 mm long, c. 5 mm diameter, glabrous, seeds not seen. **Fig. 1.**

***Specimens examined*:** **Queensland.** DARLING DOWNS DISTRICT: "Myall Park", Glenmorgan, May 1960, *Blake* 21234 (BRI). **New South Wales.** Eura S.F., c. 18 km SSE of Gilgandra, 31° 51'S, 148° 42'E, Mar 2003, *Binns* 9873 (BRI, NSW); 2 miles [3 km] SW of Mendooran, towards Dubbo, Nov 1969, *Coveny* 2492 (NSW); Goobang N.P., 32° 41'S, 148° 17'E, May 2003, *Robertson* s.n. (BRI); Eura S.F., c. 18 km SSE of Gilgandra, 31° 51'S, 148° 42'E, May 2003, *Robertson* s.n. (BRI); northern boundary of Goonoo S.F. & Coolbaggie Nature Reserve, 31° 58'S, 148° 44'E, May 2003, *Robertson* s.n. (BRI); Crow Mt, Barraba, Nov 1913, *Rupp* (NSW); Pilliga West S.F., c. 30 km NW of Baradine, 30° 45'S, 149° 50'E, May 2003, *Binns* 9879 (BRI).

***Habitat and distribution*:** *Tylophora linearis* occurs most commonly in dense shrubland that may be overtopped by eucalypts. At the Mendooran site, Coveny noted that this species grew in association with *Acacia hakeoides, A. lineata, Myoporum* sp. and *Casuarina* sp. At the newly documented localities in the Dubbo area (Eura S.F., Goobang N.P. and Goonoo S.F./Coolbaggie N.R.), the plants were encountered among dense shrubland of *Melaleuca uncinata* with scattered *M. erubescens* and other shrub species, and in adjacent areas of woodland to open woodland with *M. uncinata* shrub understorey, on flat to gently undulating landscapes at 300–400 m altitude. In Eura S.F., the woodland is variously of *Eucalyptus crebra, E. sideroxylon and Callitris glaucophylla,* in Goobang N.P. it is of *E. microcarpa* and in Goonoo S.F./Coolbaggie N.R., the dominant trees are *E. crebra* and *E. dumosa. Tylophora linearis* individuals have been observed twining

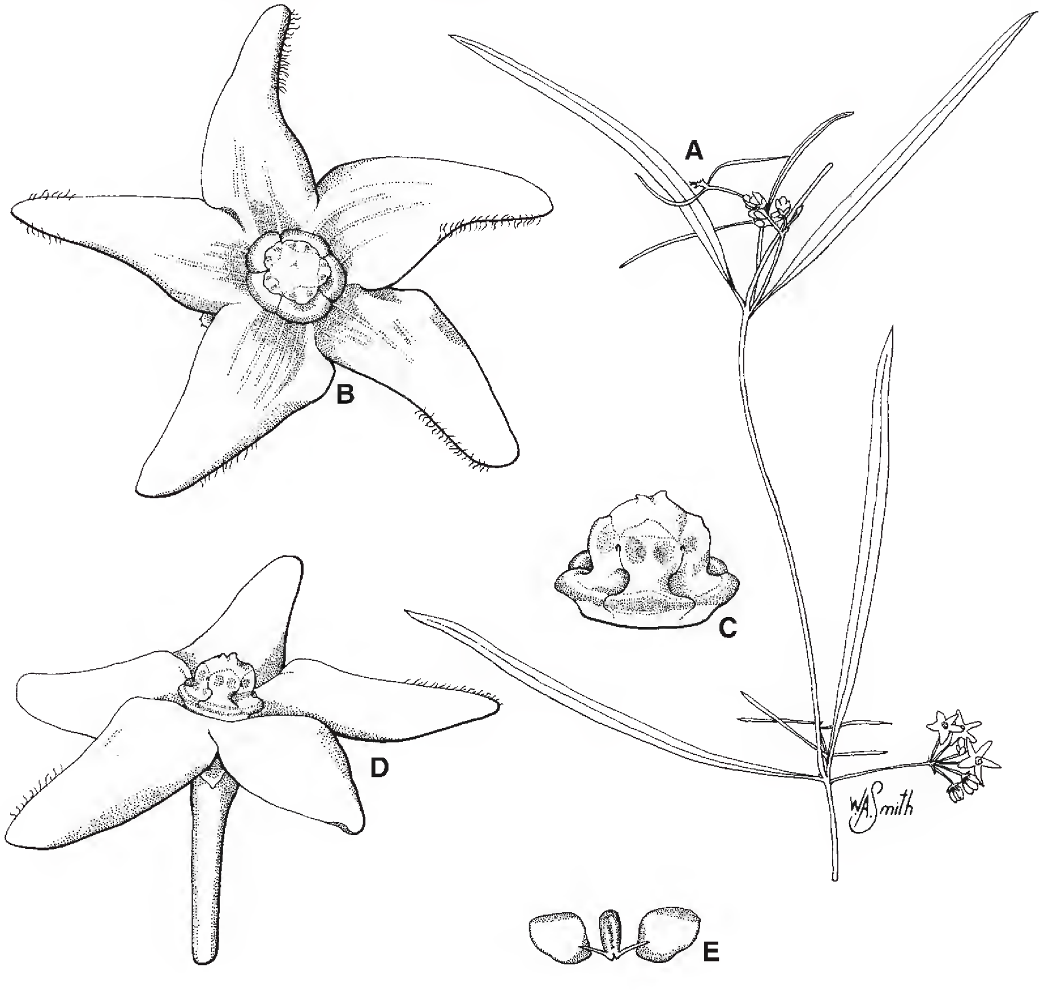

Fig. 1. ***Tylophora linearis***. A. habit of flowering stem. × 0.5. B. face view of flower. × 0.6. C. side view of flower. × 6. D. side view of gynostegium. × 12. E. pollinarium. × 40. All from *Binns* 9873 (BRI). Del. W. Smith.

around the stems of *Melaleuca uncinata,* with the occasional plant twining around *Calytrix tetragona, Acacia tindaleae, Lissanthe strigosa and Leptospermum divaricatum.* The critical habitat defining feature in these areas appears to be the presence of the dense understorey of *Melaleuca uncinata*, however survey has been biased towards these habitats. Recently another location was found in Goobang National Park in *Eucalyptus fibrosa* woodland where *Melaleuca uncinata* is a minor component of the understorey. At this locality *Tylophora linearis* was found on *Dodonaea viscosa* and *Acacia doratoxylon.*

In contrast, the collection from Pilliga West S.F. was from woodland of *E. pilligaensis* and *Callitris glaucophylla*, with a moderately dense subcanopy and understorey of *Allocasuarina luehmannii* and scattered *Acacia hakeoides*. Plants were twining on *A. luehmannii* stems. There is also a sight record of a flowering specimen in Cumbil S.F. (30° 46’E, 149° 04’S, Binns obs. 8 May 2003) from regrowth *Callitris glaucophylla* forest with occasional *E. melanophloia* and *E. crebra*. The understorey comprised scattered shrubs and a sparse grassy ground layer dominated by *Aristida ramosa*, *Digitaria diffusa*, *Aristida* *leichhardtiana*, *Whalleya subxerophylla* and *Eulalia fulva*. This site included more than 100 separate shoots over an area of about 0.5 ha, and several shoots with senescent umbels, but only a single flowering specimen. Mature shoots were climbing on fallen dead branches, shrubs of *Geijera parviflora*, *Acacia deanei* and *Hakea decurrens*, and small trees of *Callitris glaucophylla*.

Sight records of vegetatively similar plants have been made over the past ten years from 43 systematic survey sites over the geographic range (28° 55' –31° 57'S and 148° 40' – 150° 55'E). These sites represent a wide range of habitats, but *Callitris glaucophylla* is common in almost half and *Allocasuarina luehmannii* is common in about 25% of sites. Other dominant overstorey species include *E. crebra*, *E. populnea* subsp. *bimbil*, *Casuarina cristata*, *E. albens* and *E. viridis*. *Melaleuca uncinata* is common in only two of these sites. If these records actually do represent *Tylophora. linearis*, as seems likely, then the habitat range is much greater than indicated by the known sites described above.

The recorded, historical latitudinal distribution is from Glenmorgan in southern Queensland in the north (last seen 1960) to Goobang National Park in central New South Wales in the south (**Map 1**).

***Notes*:** The new collections of *Tylophora linearis* have enabled a number of additions and changes to the morphological description of this species (cf. Forster 1992, 1996). Perhaps most significant of these is that plants of this species do not form subshrubs, nor are they particularly woody. Instead *Tylophora linearis* appears to be an herbaceous twiner, a life form that is widespread in Australian asclepiads, particularly those that occur in non-rainforest communities. Plants appear to be perennial, and regenerate from a thickened rootstock. A number of Australian asclepiads are geophytic in lifeform, with the annually produced aerial parts being shed in times of drought (e.g. various *Marsdenia* spp., *Rhyncharrhena linearis*, Nichols *et al.* 1991; Forster 1995). Such a lifeform also tends to reduce the annual timeframe when plants may be noticeable.

A few plants were partially excavated. These were seen to have thickened vertical rootstocks from ground level to a depth of between 5 and 20 cm, where the vertical portion joined a thinner horizontal rhizome. In the one case where the latter was further excavated, it was traced to another shoot. This suggests that the species is clonal to at least some extent, and may be extensively clonal. Large numbers of shoots may represent few genets. Each population included varying proportions of flowering shoots with long internodes that appear to rapidly elongate, and other, shorter shoots with smaller leaves, where apical elongation appears to have slowed or ceased. It appeared that the latter stem type occurred predominantly in open patches where no supporting shrub stems were in close proximity. This was especially evident at the Cumbil S.F. site where numerous short shoots occurred on the cleared road verge and longer flowering shoots were restricted to adjacent forest. It is possible that shoot elongation and subsequent flowering is stimulated to some extent by a shoot encountering a support for climbing.

When compared to the earlier collections, recent collections have significantly larger and longer leaves and larger flowers with longer pedicels and corolla lobes. Whether these differences are population based or more an artefact of the process of specimen preparation is unknown, but the latter seems likely. Several of the early collections are of poor standard.

Floral anthesis is quite variable in this plant and may be correlated with light. Flowers close during the late afternoon with the corolla lobes reflexing forward so that the staminal column is obscured. Under bright light, the corolla lobes reflex so that the corolla lobes lie flat and the staminal column is fully exposed. In one case, flowers which were closed at about 3 pm when collected, opened after brief (less than 30 minutes) exposure to fluorescent light later that evening. Flowers open non-synchronously on different umbels with only one or two flowers open at any one time on any single umbel. These traits of floral behaviour are not unusual in *Tylophora* and have been observed in other species such as *T. benthamii* Tsiang, T. *colorata* C.T.White, *T. erecta* F.Muell. ex Benth., *T. flexuosa* R.Br., *T. glabriflora* (Warb.) Schltr., *T. grandiflora* R.Br., *T. rupicola* P.I.Forst. and *T. williamsii* P.I.Forst. (Forster 1992, 1994).

Flowering cues are unknown, but may be partly related to rainfall. The first collection from Eura S.F. was several weeks after brief but relatively intense rain (estimated about 20 mm), following a long period of drought. Buds and developing inflorescences were numerous and no umbels had bare pedicels from which flowers had fallen, suggesting that anthesis had begun only a few days earlier. Three weeks later, all flowers had fallen from that cohort of umbels and another cohort had developed to the point of anthesis. Further rain fell during that period.

Individuals of *Tylophora linearis* are difficult to distinguish from those of *Rhyncharrhena linearis* or *Marsdenia viridiflora* R.Br. when only juvenile or sterile plants are encountered. *Marsdenia viridiflora* has copious white latex, but *T. linearis* and *R. linearis* both have clear latex. *Tylophora linearis* has a corolla that is valvate and purple, and staminal coronal lobes that are rounded to somewhat flat-topped and do not extend above the style-head, whereas *Rhyncharrhena linearis* has a corolla that is imbricate and purple, and staminal coronal lobes that are saccate and elongated, with tips extending above the style-head (see illustration in Forster 1996) and *Marsdenia viridiflora* has a campanulate corolla that is green-yellow in colour (see illustration in Forster 1995). *Rhyncharhena linearis* usually occurs in drier vegetation communities than *Tylophora linearis* and has a more inland distribution, whereas *Marsdenia viridiflora* is at its southern limit in southern Queensland (apart from a couple of populations in northern New South Wales) and tends to grow in vegetation communities on heavier clay soils.

Ecology: We have little or no information on biotic interactions with *Tylophora linearis.* The pollinator(s) for *Tylophora linearis*, or any other species of *Tylophora* are unknown (Ollerton & Liede 1997). As with most asclepiads, insect-mediated transfer of pollinaria from flower to flower is necessary for pollination.

Larvae of the Lesser Wanderer butterfly (*Danaus chrysippus petilia* (Stoll, 1790)) have been observed at Eura S.F., Goobang N.P. and Cumbil S.F. feeding on foliage of *Tylophora linearis* (G. Robertson and D. Binns, pers. obs., April 2003 at Eura S.F.) and this represents a new host-plant record for this species. Other native host plant records (all Apocynaceae: Asclepiadoideae) for the Lesser Wanderer include *Brachystelma glabriflorum* F.Muell., *Cynanchum carnosum* (R.Br.) Schltr., *C. floribundum* R.Br., *Marsdenia australis* (R.Br.) Druce, *Oxystelma esculenta* (L.f.) R.Br. ex Schult., *Rhyncharrhena linearis, Vincetoxicum christineae* (P.I.Forst.) S.Liede and *V. liebianum* (F.Muell.) S.Liede (Braby 2000). Naturalised asclepiad hosts include *Asclepias curassavica* L., *Calotropis gigantea* (L.) W.T.Aiton, *C. procera* (Aiton) W.T.Aiton, *Gomphocarpus cancellatus* (Burm.f.) Bruyns and *G. fruticosus* (L.) W.T.Aiton (Braby 2000). All of the native host plants are herbs or twiners, usually with reduced foliage (lamina linear to lanceolate). Several of the native host plants have annual stems (*Brachystelma glabriflorum, Oxystelma esculenta, Vincetoxicum christineae, V. liebianum*) and as noted previously for the first listed species (Forster 1991), the larvae are only able to feed on the plants in the relatively short period of time when the shoots are actively being produced. One plant in Goobang N.P. supported two larvae of different instars and had been substantially depleted by feeding. Each larva is likely to require more than one shoot to mature and the effects of larval predation on shoot, flower and fruit production may be locally substantial.

Many of the plants in Goobang N.P. and Eura S.F. were twining on regrowth stems of *M. uncinata* following commercial harvest for broombush, which completely removes stems at about 20 cm above ground level. The size of the regrowth stems indicated the harvest event occurred about 10 years previously. It is probable that the *Tylophora* survived the harvest, but it may also have colonised the area since harvest. Part of the population in Goobang N.P. was burnt by a moderate intensity fire about 12 months prior to observation. The fire killed the aerial parts of the *Melaleuca uncinata* and burnt the foliage and small twigs, but most shrubs were regrowing from basal shoots. The *Tylophora linearis* plants were clearly resprouting from stems which existed prior to the fire, indicating that the plant has an ability to survive at least moderate intensity fire.

Conservation status: *Tylophora linearis* is currently listed as Endangered under Australian Federal (*EPBC*), Queensland (*NCA*) and New South Wales (*TSCA*) legislation. It is an inconspicuous plant that is likely to be overlooked by less than ardent botanical collectors. The relative ease with which several additional localities were found during a short period of specific searching following the initial rediscovery suggests that the apparent rarity may be an artefact of undercollection, at least in the Dubbo–Pilliga area. However, the total known population size and area of occupancy remain small. The broad historical distribution for the species (range of c. 900 km), together with broad scale land clearing during the 20th century, may indicate that the paucity of collections elsewhere is real as well as being an artefact of undercollection. Searches after rain are required in other parts of its historical range.

At Eura State Forest, at least 270 separate shoots, in over 150 clumps, were seen over 0.5 ha, twining around plants of *Melaleuca uncinata* and occasionally other shrubs. At Pilliga West S.F., about 20 shoots were seen over 0.2 ha, mostly twining around *Allocasuarina luehmannii*. At Cumbil S.F., over 100 shoots were seen over 0.2 ha, but at least 80% were small shoots not of flowering size.

Whilst most plants of *Tylophora linearis* have been found closely associated with *Melaleuca uncinata*, this has not meant that the *Tylophora* is correspondingly common where large areas of the *Melaleuca* are present. Nevertheless, the occurrence of this plant, apparently preferentially, in closed shrubland of *Melaleuca uncinata,* may lend clues to extending the known occurrence of *Tylophora linearis*. *Melaleuca uncinata* is widespread in inland Australia from Lake Lucy in Queensland (18° 33'S) to near Bendigo in Victoria (36° 30'S) and westwards to south-west Western Australia. Although the largest and most floriferous populations of *Tylophora linearis* are associated with *Melaleuca uncinata* shrublands, its distribution is not limited to an association with this species.

Despite recent records, the conservation status of *Tylophora linearis* using the criteria defined by the IUCN (Anon. 2001) remains uncertain, particularly in relation to criteria based on estimated population changes. However, the IUCN criteria are based on a time scale of, at most, several decades. The absence of records, other than those reported here, over the last several decades, renders any assessment of recent population changes rather speculative. Known populations occur in habitats which are not subject to any evident significant threat and there is no reason to expect recent or future decline. However, it is unknown whether populations may be subject to extreme fluctuations through unidentified causes. Using a precautionary assessment which assumes such fluctuations are possible, and using known populations only, *Tylophora linearis* meets Endangered criterion B2ac. Alternatively, assuming that extreme fluctuations are unlikely, it meets only the Vulnerable criterion D (fewer than 1000 mature individuals, in five or fewer populations). This is suggested as the most realistic assessment with current information.

Acknowledgements

Thanks to W. Smith (BRI) for the illustrations and map.

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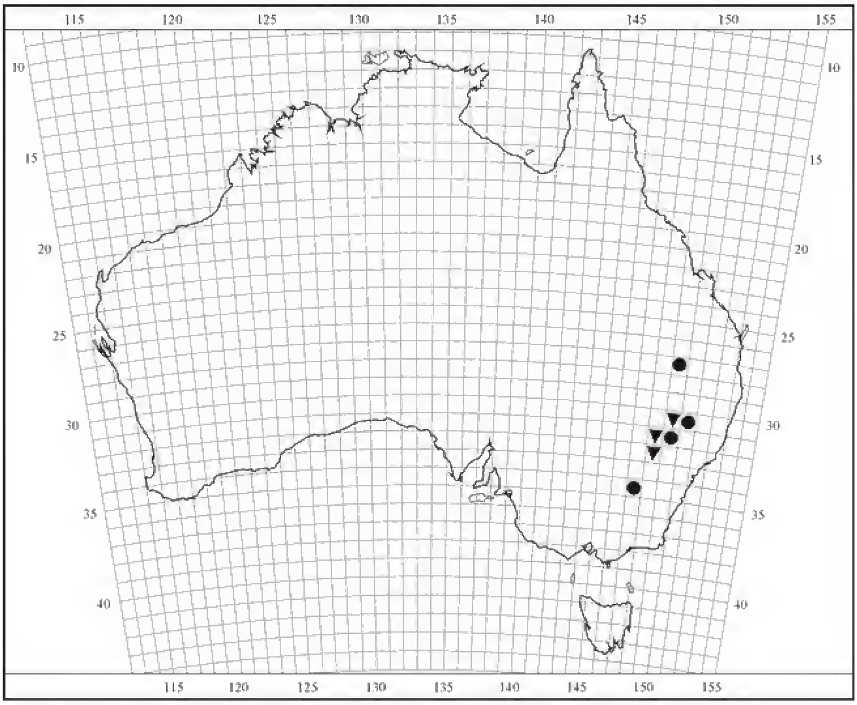
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Map 1. Distribution of *Tylophora linearis* in Australia. Records pre 1970 ● , records post 1970 ▼ .

New Australian species in the lichen genus *Siphula* Fr.

Gintaras Kantvilas

Summary

Kantvilas, G. (2004). New Australian species in the lichen genus *Siphula* Fr. *Austrobaileya* 6 (4) 949–955. Two species of *Siphula* are described and illustrated: *S. australiensis* Kantvilas sp. nov. from the Central and Southern Tablelands of New South Wales, and *S. parhamii* Kantvilas sp. nov. from the humid wet tropics of Queensland. Their relationships with other taxa in the genus are discussed. An unusual, peltate form of *Siphula coriacea* Nyl. from Central Queensland is briefly noted and illustrated.

Keywords: lichens, lichenized fungi, *Siphula*, Australia

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Introduction

The lichen genus *Siphula* Fr. is characterised by a foliose to fruticose thallus with well-developed root-like rhizines and a green, unicellular photobiont. Ascomata are completely unknown for any species of the genus and consequently, without the benefit of characters of apothecial ontogeny, anatomy and morphology, ascus structure and ascospore morphology, the taxonomy of *Siphula* is notoriously difficult. The situation is complicated further by the broad range of morphological variation displayed by most species, often in response to subtle variations in ecological factors. The current species-level classification is based extensively on chemical composition, and correlations between this and morphology, ecology and geographical distribution; this approach has been applied to the delimitation of species from Tasmania (Kantvilas 1996, 1998) and South America (Kantvilas & Elix 2002).

The taxonomic position of the genus is still unclear although several molecular studies have indicated that the closest relatives of at least some *Siphula* species are to be found in the family Icmadophilaceae (Stenroos & De Priest 1998, Platt & Spatafora 1999), an hypothesis based on molecular data but not inconsistent with morphological, chemical and ecological information (Kantvilas 2002).

A recent word-wide review of the genus (Kantvilas 2002) recognised 23 described species, with main centres of diversity in temperate Australasia, tropical America, southern South America, and southern Africa and the Macarene Islands. Several undescribed species are also known and two of these, both from mainland Australia, are described here. An unusual form of the Australasian endemic, *S. coriacea* Nyl., is also discussed briefly.

Materials and Methods

This study is based on herbarium specimens held in CANB and HO, although comparative material and types from most major herbaria have also been examined over the last decade. Thallus anatomy was studied by high-power microscopy of hand-cut sections mounted in water, 10% KOH, lactophenol Trypan Blue and ammoniacal Congo Red. Chemical composition was determined routinely via thin-layer chromatography using standard methods (Orange *et al.* 2001), with selected, critical, confirmatory analyses undertaken by Prof. J.A. Elix, Canberra, using high performance liquid chromatography (Feige *et al.* 1993).

Taxonomy

1. Siphula australiensis Kantvilas, **sp. nov.**

Aliquot similis *Siphulae decumbenti* Nyl. et item acidum thamnolicum continens sed habitu folioso, lobis late rotundatis concavisque et rhizinis sparsis differens. **Typus:** Australia: New South Wales. Pigeon House Mountain, 35°21'S 150°16'E, *c.* 650 m altitude, on vertical rock face in a west-facing, rather moist cleft, 21 October 1999, *G. Kantvilas* 344/

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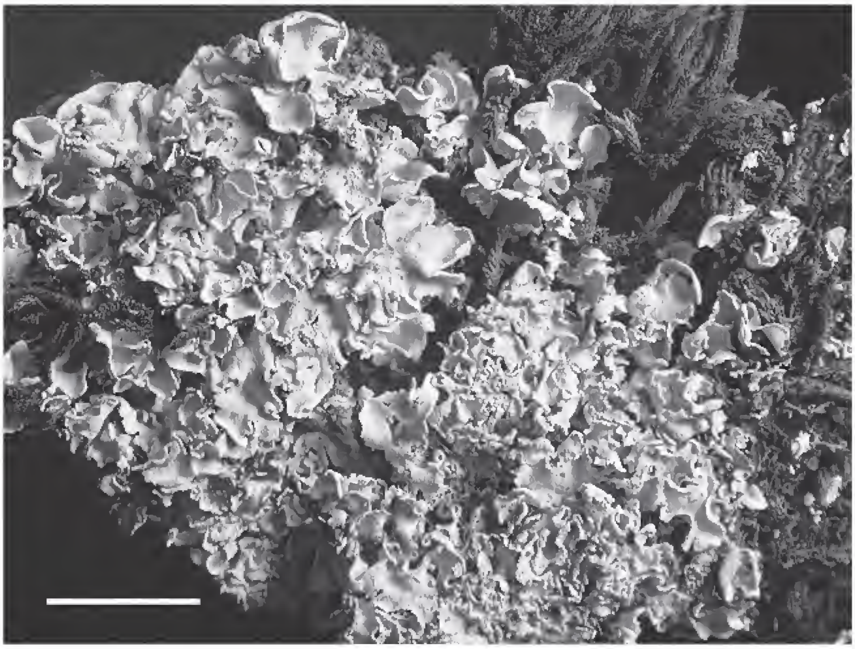

Fig. 1. ***Siphula australiensis*** Kantvilas (holotype). Scale = 10 mm.

99 (holo: HO; iso: GZU, NSW).

Thallus foliose, loosely attached to soil or soft sandstone. Lobes markedly flattened, decumbent, generally discrete, spreading and broadly rounded at the thallus margins, much divided, contiguous to imbricate and at times ± erect and subfruticose in the thallus centre, undulate to concave, sometimes ± cochleate, 1–3 (–6) mm wide, with dorsal and ventral surfaces ± identical; surface chalky white, sometimes developing a faint beige tinge in the herbarium, generally smooth in younger parts of the thallus but becoming verrucose in older parts, very intensely and coarsely scabrid-mealy throughout; margins ± entire or minutely and irregularly crenulate, undulate or ascending, not thickened, very brittle and frequently fractured. Thallus in section 120–230 µm thick; well-defined cortex absent, but outermost layers of the thallus with a 10–50 µm thick layer of tiny crystals not dissolving in KOH, visible at high-power magnification in polarised light; photobiont cells spherical, 7–13 µm diam., irregularly clumped, especially beneath the dorsal surface of the the thallus; medullary hyphae rather loosely and irregularly interwoven, 5–8 µm thick, with walls to 3 µm thick. Rhizines mostly uncommon and typically widely scattered, pale brownish, 0.25–0.5 mm thick at point of attachment. **Fig.1.**

***Chemistry*:** thamnolic and decarboxythamnolic acids; K+ intense yellow, sometimes slowly becoming brownish red, KC-, C-, P+ orange, UV-.

***Additional specimens*:** **New South Wales.** Katoomba, Mar. 1965, *G.C. Bratt & J.A. Cashin* 2040 (HO); Evans Lookout, *c.* 4 km E of Blackheath, Apr. 2002, *G. Kantvilas* 178/02 (HO); Pigeon House Mountain, on sandstone rock, Sept. 1977, *D. Verdon* 3126 (CANB); same locality and date, *J.A. Elix* 3930 (CANB); same locality, Nov. 2000, *G. Kantvilas* 488/00 (HO).

***Remarks*:** *Siphula australiensis* is most closely related to the widespread *S. decumbens* Nyl., and both species share a chalky white thallus and thamnolic acid as the major chemical constituent. The main difference between the two taxa lies in their growth habit: foliose with spreading, generally rounded, cochleate, marginal lobes in the former, but distinctly fruticose with crowded, elongate lobes in the latter. Although *S. decumbens* is extremely variable (see Kantvilas 1998), none of the

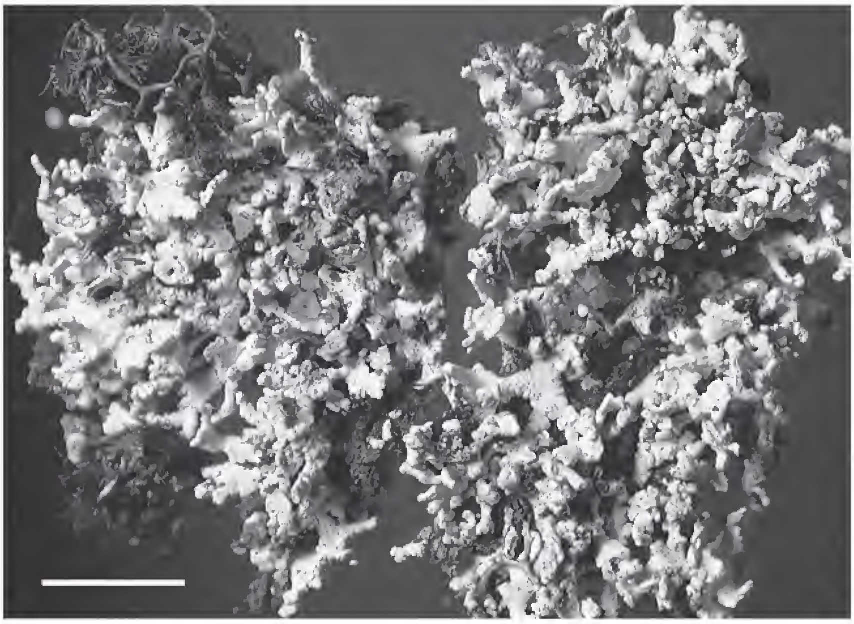

Fig. 2. ***Siphula parhamii*** Kantvilas (isotype). Scale = 5 mm.

material studied, encompassing a very wide range of localities and habitats, even remotely approaches the distinctive growth habit of *S. australiensis*. The differences in morphology are manifest in subtle anatomical differences. Thus in *S. decumbens*, the relatively thick medullary hyphae are periclinal whereas in *S. australiensis* they are irregular or anticlinal. Similarly the rhizines of the two species differ, with those of *S. decumbens* occurring as a thick, basal tuft, whereas those of *S. australiensis* are scattered on the ventral surface.

Perhaps the lichen that is superficially most similar to *S. australiensis* is *Icmadophila splachnirima* (Hook.f. & Taylor) D.J. Galloway, a widespread species that grows on wet peaty soil in cool to cold temperate areas of Australasia. Like *S. australiensis*, this species also has a foliose habit, rounded, often cochleate lobes and contains thamnolic acid, but the lobes are generally thinner and not markedly scabrid and mealy. The presence of pink apothecia, characteristic of the Icmadophilaceae in general, and the absence of rhizines make *I. splachnirima* easily identifiable, but the resemblance between the two species is striking and perhaps offers some insight into their relationships at a higher taxonomic rank.

***Distribution and habitat*:** *Siphula australiensis* is locally common at the type locality and at other scattered locations on the sandstone escarpment of the New South Wales Tablelands. It grows in moist, sheltered clefts and on ledges, usually on large cliffs and bluffs. Vertical rock faces are especially favoured. That the new species is restricted to such habitats probably indicates a relict distribution in fire-protected refugia, rather than necessarily a predisposition to grow on moist, vertical rocks. In this habitat, it is typically intermixed with an algal film, small ferns and bryophytes, but other lichens with which it was associated at the type locality include *Cystocoleus ebeneus* (Dillwyn) Thwaites, *Leioderma duplicatum* (Müll. Arg.) D. J. Galloway & P.M. Jørg. and depauperate tufts of *Cladia aggregata* (Sw.) Nyl. and *Cladonia pertricosa* Kremp.

2. Siphula parhamii Kantvilas, **sp. nov.** Arcte affinis speciei austroafricanae endemicae *Siphulae torulosae* (Thunb. ex Ach.) Nyl. a qua lobis decumbentibus robustioribusque, caespes laxiores formantibus imprimis differt. **Typus:** Australia: Queensland. Mt Finnigan, Mt Finnigan Range, Cedar Bay National Park, 15°49'S 145°16'E, 1090

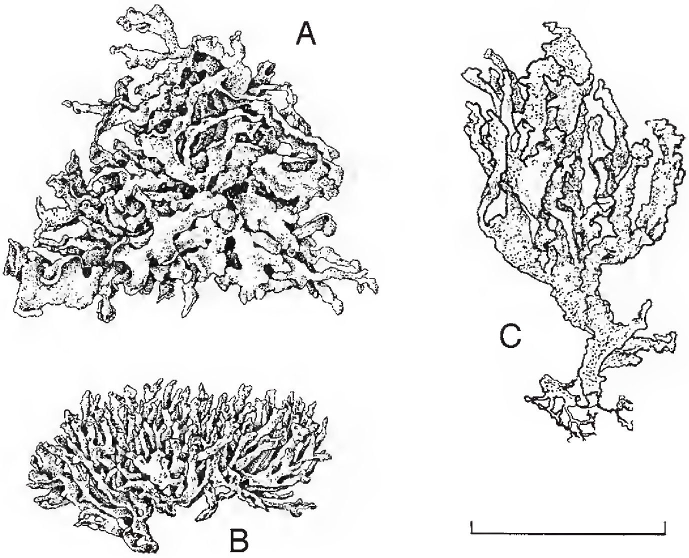

Fig. 3. Variation in baeomycesic acid and squamatic acid-containing species of ***Siphula***. A: ***S. parhamii*** Kantvilas (part of holotype); B: ***S. torulosa*** (Thunb. ex Ach.) Nyl. (*Brusse* 2527, HO); C: ***S. fastigiata*** (Nyl.) Nyl. (*Moscal* 11956, HO). Scale = 10 mm. (A–B drawn by Lauren Black; C drawn by Georgina Davis)

m altitude, on exposed rocky ground in exposed heathy-grassy area with large rock outcrops, 20 October 1995, *H. Streimann* 57192 (holo: CANB; iso: HO).

Thallus fruticose, forming scattered or contiguous clumps mostly 10–30 mm wide over stones and gravelly soil. Lobes generally markedly flattened, decumbent, ± discrete or, more commonly, loosely overlapping, 30–50 (–100) mm long, 0.4–1 (–1.5) mm wide, with dorsal and ventral surfaces ± identical; surface dull whitish grey, matt, generally unevenly puckered and dimpled, neither mealy nor scabrid, patchily discoloured by a sparse to moderately dense 'veil' of black, unidentified fungal hyphae composed of chains of rhomboid cells 5–6 µm wide; margins entire or irregularly crenulate, unevenly thickened in places, sometimes with knob-like projections; apices erect or ascending, sometimes with short, subterete extensions, or rather thickened and knob-like. Thallus in section 250–600 µm thick, lacking a well-defined cortex but with a brownish grey outer layer *c.* 10 µm thick; photobiont cells irregularly roundish, 8–15 µm wide, mostly single but sometimes in pairs or tetrads to 20 µm wide, typically concentrated in a continuous or interrupted layer beneath the dorsal surface, sometimes also occurring in bundles through the entire thickness of the thallus or at the ventral surface; medullary hyphae periclinal, densely entwined and ± conglutinated, 1–2 µm thick. Rhizines pale grey-brown, *c.* 0.25 mm at point of attachment. **Figs 2, 3A.**

***Chemistry*:** baeomycesic and squamatic acids; K+ pale yellowish, C-, KC-, P+ yellow-orange, UV+ pale yellow-orange with whitish patches. These two compounds appear to be irregularly distributed in the thallus, with squamatic acid mainly in the internal, medullary area and baeomycesic acid near the thallus surface. Hence, in UV light, the thallus surface appears pale orange-yellow, but abraded or fractured areas where squamatic acid containing tissues are exposed react UV+ whitish.

***Additional specimen*:** **Queensland.** Mt Finnigan, on exposed boulder, Oct 1995, *H. Streimann* 57206 (CANB).

***Remarks*:** *Siphula parhamii* is a distinctive species in the Australian flora, characterised by the relatively robust, decumbent lobes that form loose tufts, and by the presence of baeomycesic and squamatic acids. Its closest relative is *S. torulosa* (Thunb. ex Ach.) Nyl.,

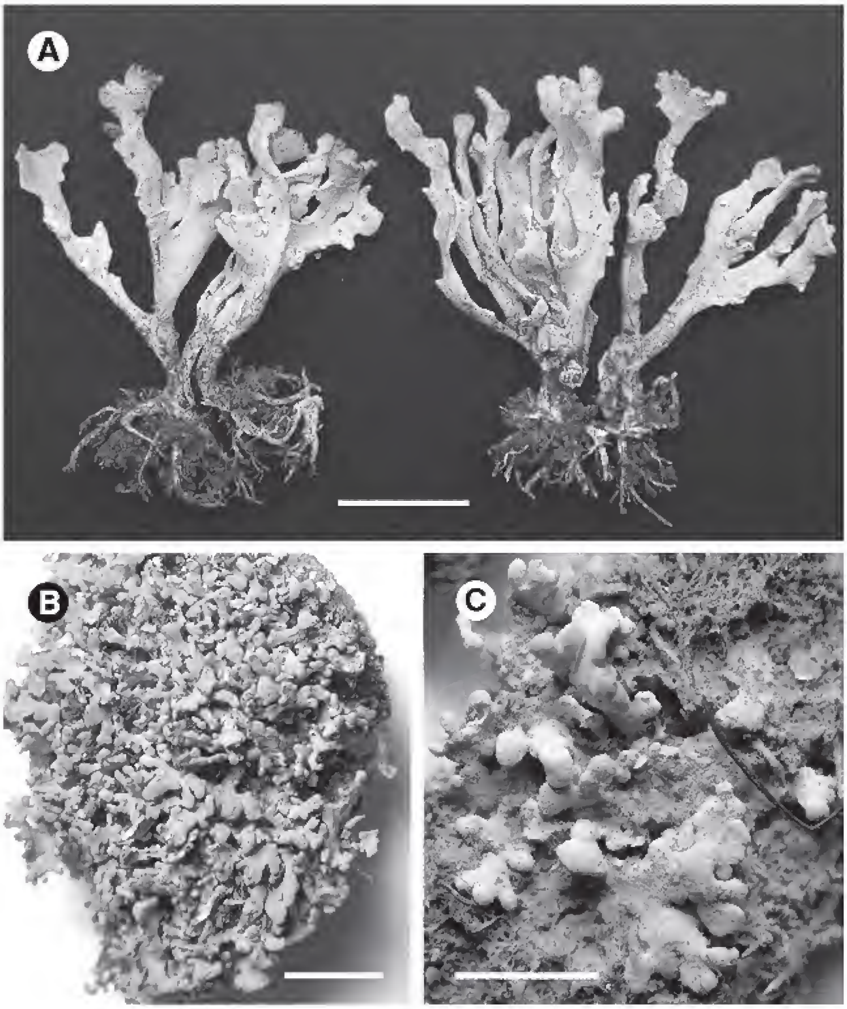

Fig. 4. Variation in ***Siphula coriacea*** Nyl. A: 'typical' erect form (*Kantvilas & Jarman* 375/92, HO); B: compact, decumbent form on rock (*Bratt* 67/515, HO); C: compact, flattened form on arid soil (*Bratt* 67/121, HO). Scales: A= 10 mm; B,C = 5mm.

endemic to the Cape region of South Africa (**Fig. 3B**). *Siphula torulosa* is chemically identical but has more slender, erect or ascending lobes, 4–12 mm tall and 0.3–0.8 mm wide, that form relatively dense tufts or swards (see also Mathey 1974). Although many species of *Siphula* are very widespread geographically and very variable morphologically (see Kantvilas 2002), *S. torulosa* is a very well-defined, localised taxon. It seems untenable to broaden its concept to include *S. parhamii,* which is localised in north Queensland and is morphologically rather extreme.

Also rather similar and chemically identical is *S. fastigiata* (Nyl.) Nyl. This species has generally erect, strap-like, chalky white lobes with a usually scabrid, mealy, sometimes intensely puckered and verruculose surface (Kantvilas (1998) (**Fig. 3C**). It ranges from Tasmania to New Zealand, southern South America and northward into tropical America. It displays extreme morphological variation but does not encompass the distinct morphologies of *S. parhamii* and *S. torulosa* (Kantvilas 2002).

Distribution and habitat**:** *Siphula parhamii* is known only from the type locality, a peak in tropical north Queensland. On the basis of specimen label data, it grows in open, grassy-

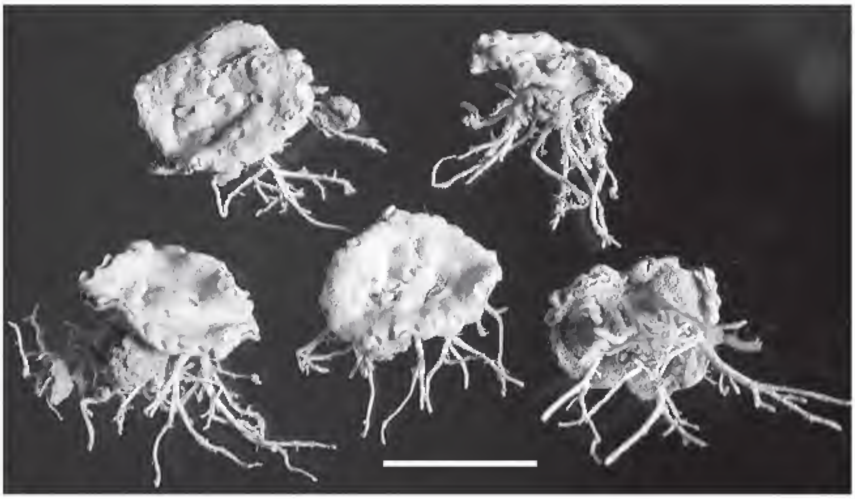

Fig. 5. An unsual peltate form of ***S. coriacea*** Nyl. (*Purdie* 4214, HO). Scale = 5 mm.

heathy vegetation, directly on rocks and on gravelly soil, intermixed with moss. The late Heinar Streimann, who collected the material, described this species as being locally abundant. It should be sought for on other peaks in the region.

Etymology**:** The new species is named in honour of Mr John Willoughby Parham, friend and mentor of the author, in recognition of his contributions to the Botany of Fiji, Queensland and Tasmania (see Kantvilas 2003).

An unusual form of *Siphula coriacea* Nyl.

Siphula coriacea is a very distinctive species, characterised by typically erect or ascending, flattened, distinctly bluish grey lobes containing barbatic acid. This chemical composition is unique in the genus. It is known from the mainland States of Australia and New Zealand and typically occurs on soil in heathland and grassland. As with most other species of the genus, this lichen is extremely variable, with elongate, loosely entangled, strap-shaped lobes when occurring in moister, sheltered habitats (**Fig. 4A**), but with very compact, short, convoluted lobes in drier, exposed locations such as on soil in the rangelands of the Australian interior (**Figs 4B–C**).

Two specimens, both from the same locality in Central Queensland, represent a very unusual form of this pecies. They have a thallus composed of discrete, flat, peltate lobes, 2.5–8.5 mm wide, 0.5–0.85 mm thick, with a plane to undulate to rather bullate and puckered, bluish grey upper surface, recurved, ± thickened margins, and a pale brownish underside with scattered, very prominent, white, dichotomously branched rhizines (**Fig. 5**). Although morphologically disjunct from *S. coriacea* as generally understood, these unusual specimens contain barbatic acid and are anatomically identical with *S. coriacea*: they have an epinecral layer to *c.* 15 μm thick, a ‘pseudocortex’ to *c.* 60 μm thick, composed of anticlinal hyphae *c.* 5 μm thick that extend from the medulla, a photobiont layer composed of a unicellular, green alga, 6–10 μm diam, and a medulla of irregularly interwoven hyphae, inspersed with crystals that dissolve in KOH. According to notes (by R.W. Rogers) accompanying one specimen, the collection is from microhabitats that are possibly waterlogged after rain but otherwise dry. This unusual form may be an environmental modification. Certainly given the degree to which *Siphula* species can vary in response to habitat, any taxonomic recognition of this odd form would need to be preceded by careful study of the populations in the field. ‘Typical’ *S. coriacea* also occurs at the same general locality.

Specimens**: Queensland.** Idalia National Park, *c.* 12 km S of Idalia homestead, on walk to Mountain Rock Hole, 24°57’S 144°47’E, 22 Sept 1992, *R.W. Purdie* 4214 (CANB, HO);

Idalia National Park, old Idalia homestead, 24°55'S 144°43'E, Feb 1996, *R.W. Rogers* 10478 (BRI).

Acknowledgements

I thank Jean Jarman for preparation of the figures, and Jack Elix and Pat McCarthy for their companionship and assistance during field work in New South Wales. Jack Elix also undertook the critical h.p.l.c. analyses. The late Heinar Streimann and Rod Rogers are acknowledged for placing at my disposal their collections.

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Chromosome records for five trigger plants (*Stylidium*; Stylidiaceae) from northern Australia

J.A. Wege

Summary

Wege, J.A. (2004). Chromosome records for five trigger plants (*Stylidium*; Stylidiaceae) from northern Australia. Austrobaileya 6 (4): 957–959. Chromosome counts are reported for five species of *Stylidium* from northern Australia. In contrast to previous hypotheses, variation in number is evident: *S. lobuliflorum* and *S. ensatum* possess n = 11, *S. schizanthum* n = 14, whilst *S. semipartitum* and *S. turbinatum* possess n = 15. As for their south-western counterparts, cytogenetic factors are postulated to be involved in the speciation of trigger plants of northern Australia.

Keywords: *Stylidium*, trigger plants, chromosomes, speciation, breeding systems.

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Introduction

The majority of cytogenetic research performed on the trigger plant genus *Stylidium* has focussed on taxa endemic to the south-west of Western Australia. This region is a primary centre of species diversification for *Stylidium*, containing approximately 70% of the currently described taxa (Wagstaff & Wege 2002). Chromosome counts have been made for a high proportion of these taxa with numbers ranging from n = 5 to n = 16, with polyploidy occurring on 13, 14 and 15 (James 1979; Coates 1982; Burbidge & James 1991). Studies on morphologically allied species have shown that chromosome number change is often a feature of species differentiation (James 1979; Banyard & James 1979; Farrell & James 1979; Coates 1982). The hypothesized base number for the genus is n = 15 and several independent dysploid reduction series are thought to have evolved (James 1979).

Since James' (1979) landmark study, taxonomic research has seen a two-fold increase in the number of species of *Stylidium* known from northern Australia. With over 60 taxa currently described (see Bean 1999, 2000) this region must now be regarded as a second area of trigger plant diversity; however, there is only one published chromosome record. James (1979; pg 22) reported a count of n = 15 made by B. & G. Keighery, although the species in question was not identified and no voucher details were given. He considered all northern species to possess the basal number of n = 15. Chromosome numbers for additional species from northern Australian were sought in order to assess whether variation in chromosome number exists in this region.

Methods

Buds were fixed in 3:1 absolute ethanol:glacial acetic acid for 24 hours, rinsed in 70% ethanol and subsequently stained with alcoholic hydrochloric acid carmine (Snow 1963). At least three separate counts were obtained from pollen mother cell meiotic material using the squash technique. Photographs were taken using a Zeiss Axiophot microscope and images captured using 6ASA imagelink film. Herbarium voucher specimens are lodged at PERTH.

Results

Variation in chromosome number between northern Australian species of *Stylidium* is demonstrated for the first time in the present study (**Table 1**). A haploid chromosome number of 11 was recorded for both *S. ensatum* and *S. lobuliflorum* (**Fig. 1**). *Stylidium turbinatum* was found to have a haploid chromosome number of 15.

An unidentified herbarium voucher specimen from south of Darwin with an annotation "chromosome count of n = 15" was recently uncovered at The University of Western Australia. The collection and count, performed by Bronwyn Keighery, is likely to correspond

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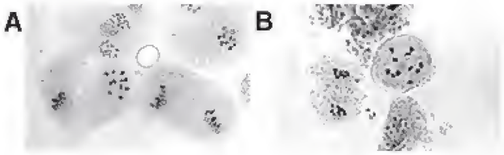

Fig. 1. Chromosomal preparations (n=11) for A) ***Stylidium ensatum*** and B) ***S. lobuliflorum***

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to the n = 15 quoted by James (1979) as occurring in species from northern Australia. This specimen has since been identified as *S. semipartitum* and has been lodged at PERTH, with a duplicate sent to BRI.

A second voucher specimen with an unpublished chromosome count was found in the collection at PERTH. The count for *S. schizanthum* of n = 14 is likely to have been performed by Sid James (G. Keighery pers. comm.).

Discussion

Whilst the data presented here do not constitute a comprehensive survey, it is likely that chromosome change is associated with speciation of *Stylidium* across northern Australia. This notion raises a number of interesting questions. Do the tropical species exhibit similar variation in chromosome number as their south-west congeners? Is chromosome number differentiation a feature of morphologically allied species? What is the nature of the breeding systems in tropical trigger plants?

The last question is raised in view of the findings of Burbidge & James (1991) that dysploidy in *Stylidium* is typically associated with post-zygotic seed-aborting systems. Although the trigger plant flower appears designed to promote cross-pollination, high levels of inbreeding may be generated by geitonogamous self-pollination. The seed-aborting systems function to significantly reduce the amount of seed set after self-pollination as compared to cross-pollination. They have been shown to occur in many trigger plants from both south-western and south-eastern Australia (Banyard & James 1979; Coates & James 1979; James 1979; Burbidge & James 1991; Willis & Ash 1990). Burbidge & James (1991) also demonstrated that seed-aborting systems operate to varying degrees in *Stylidium* depending on the species in question. They can be absent, weak or highly efficient in species with the hypothesized base number of n = 15; however, those species with reduced chromosome numbers almost always exhibit efficient systems.

If one were to apply the results of Burbidge & James (1991) to the present study, one would expect efficient seed-aborting systems to be present in those tropical trigger plants with reduced chromosome numbers;

Table 1. Chromosome numbers (n) of species of *Stylidium* from Northern Australia

Classification (Milbraed 1908)	Species	Voucher	Approximate Locality	n
Subgenus *Andersonia* (R.Br) Mildbr.	*S. ensatum* A.R. Bean	JAW 470 (PERTH 05596513)	McMinns Lagoon, E of Darwin	11
	S. lobuliflorum F.Muell	JAW 478 (PERTH 05596521)	SW of Jabiru, Kakadu National Park	11
	S. schizanthum F.Muell	G.J. Keighery 4738 (PERTH 03163296)	Mitchell Plateau, Kimberleys	14
Subgenus *Tolypangium* (Endl.) Mildbr.				
section *Debiles* Mildbr.	*S. semipartitum* F.Muell	G.J. Keighery s.n. (PERTH 05596548)	Burrell's Creek S of Darwin	15
section *Floodia* Mildbr.	*S turbinatum* Lowrie & Kenneally	JAW 477 (PERTH 05596483)	Arhnem Highway, Kakadu National Park	15

however, this phenomenon would be an evolutionary disadvantage given the majority of these species are annuals and rely on seed set for regeneration. Burbidge & James (1991) found seed-aborting systems to be absent in the south-west annuals from *S.* section *Despectae* (n = 15). They noted that self-pollination is less likely to occur in these species because individuals are few-flowered and populations typically consist of very large numbers of plants over a small area. In contrast, geitonogamous self-pollination is a more likely occurrence in tropical trigger plants given the branched, many-flowered inflorescences and multiple scapes of many species. Further, Carlquist (1979) suggested that selfing is a favorable adaptation in tropical trigger plants and outlined a number of morphological features that may facilitate it, such as the widespread occurrence of a column pouch into which pollen can be shed, and from which the stigma can later receive. If such features have indeed evolved to promote self-pollination, then it is doubtful whether efficient seed-aborting systems have been associated with chromosome change in these species.

An alternative scenario is that tropical trigger plants with reduced chromosome numbers may possess weak seed-aborting systems, as is the case in *S. calcaratum* (n = 11) and *S. ecorne* (n = 13) from *S.* subgenus *Centridium* (for which there are northern Australian representatives) (Farrell & James 1979). Prior to this study, these two species were the only annual trigger plants recorded as having reduced chromosome numbers. Clearly further research is warranted on chromosome number variation in northern Australian trigger plants in conjunction with studies on the nature of their breeding systems.

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Thanks are extended to David Coates for comments and discussion; Bronwyn Keighery for granting permission to publish her chromosome count; Greg Keighery for assistance with vouchering queries; the Northern Territory Herbarium (DNA) for providing access to collection information; and The Northern Territory Government and Australian National Parks and Wildlife Services for permission to collect in the Northern Territory and Kakadu National Park. This project formed part of a PhD dissertation completed at the Department of Botany, The University of Western Australia and was supported by an Australian Postgraduate Award.

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Gonocarpus hirtus Orchard (Haloragaceae), new from southeastern Queensland and northeastern New South Wales

A.E.Orchard

Summary

Orchard, A.E. (2004). *Gonocarpus hirtus* Orchard (Haloragaceae), new from southeastern Queensland and northeastern New South Wales. *Austrobaileya* 6 (4): 961–965. A new species from the ranges southwest of Brisbane, and the northeastern highlands of New South Wales, is described and illustrated. *G. hirtus,* found in dry sclerophyll forest, belongs to a complex of weak scrambling subshrubs found throughout the Great Dividing Range, from Victoria to Queensland, and is most closely allied to *G. longifolius* and *G. effusus*.

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Introduction

The genus *Gonocarpus* comprises 42 species, widespread in Australia and New Zealand, with a few species also extending to New Guinea, Indonesia, the Philippines, Japan and SE Asia. There are 37 species in Australia, the majority in dry to damp sclerophyll forest, but with some species found in almost all habitats. The genus was revised by Orchard (1975), with additional species described in Orchard (1977, 1986). A summary of the then-known Australian species was published by Orchard (1990).

With their often sparse, scrambling habit and inconspicuous flowers, *Gonocarpus* species are frequently overlooked by all but the most thorough collectors, and are probably under-represented in most collections. Despite this, sporadic collecting has led to a steady increase in numbers of new taxa described since the last revision, particularly from the ranges of the eastern seaboard. In the dry to damp sclerophyll forests of the eastern ranges of Victoria, New South Wales and Queensland the understorey often contains one or more species of *Gonocarpus*. In the driest areas, particularly on rocky outcrops, the most common species is the alternate-leaved *G. elatus*. In slightly damper areas, subject to enhanced runoff or higher rainfall *G. elatus* is replaced by the most common *Gonocarpus* of all, *G. tetragynus.* In even damper situations the scrambling *G. humilis* or the more erect shrubby *G. teucriodes* replaces *G. tetragynus*, to be replaced in turn by members of the *G. longifolius* complex. G. *tetragynus, G. humilis, G. teucrioides*, and members of the *G. longifolius* complex (*G. longifolius, oreophilus, G. effusus*) all have opposite leaves, which usually become alternate above as they merge into the bracts of the inflorescence.

Gonocarpus elatus differs from all others below in having uniformly alternate leaves. Its fruit is irregularly rugose with about 4 rows of rounded tubercles, while that of the opposite-leaved species is uniformly 8-ribbed with 3–4 oblique calluses between the pairs of ribs, often sloping in alternate directions in each vertical row, forming a chevron pattern.

Gonocarpus tetragynus is a small subshrub, rarely exceeding 30 cm tall, and is easily recognisable by its lanceolate leaves with a distinctive indumentum of evenly distributed, closely appressed stiff hyaline hairs. The remaining species are usually much larger plants.

G. longifolius is a subshrub 35 to 100 cm tall, found mainly in shrub communities on sandstone soils from sealevel to about 600 m, mainly in New South Wales, from the Blue Mountains to New England, and extending just over the border into SE Queensland. See Bell (2001) for a discussion of recent range extensions. It is characterised by its long, soft, spreading hairs on stems and sometimes on the leaves, and by its linear-oblong leaves, 1.3–3.2 mm long, with 20–30 small cuspidate teeth.

G. humilis is usually a much weaker, scrambling plant, with relatively long soft hairs on the stems and leaves, more or less ovate

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leaves, and differs from other species of the complex in having very short (to 1.5 mm) petals and anthers, the latter reduced to 4 instead of the usual 8. The missing whorl of stamens may be replaced by small staminodes. *G. humilis* seems to prefer damp or swampy areas within sclerophyll forest, from sealevel to about 1200 m.

G.. teucrioides is a more robust species than *G. humilis*, with more hispid hairs, usually seated on swollen multicellular bases. It has the usual 8 stamens, and can be distinguished from all other members of the complex by its large, green, fleshy, lanceolate to narrowly ovate bracteoles which often more or less conceal the ovary of the flower. The bracteoles of other members of the complex are usually brown, narrow, and much smaller than the ovary. *G. teucrioides* is usually found in the understorey of dry sclerophyll forest, from sealevel to about 1200 m, but has also been recorded on the margins of rainforest and in subalpine communities.

G. oreophilus has a similar distribution to *G. longifolius*, but is found in rainforest or wet sclerophyll forest at 300–1500 m. It is distinguished from *G. longifolius* by its larger (1.0–3.5 cm) ovate to oblong leaves with 15–30 rounded teeth, and by an indumentum on the stems and leaves which is fine, very short, and almost velvety.

G. effusus is a further member of the complex, confined to the Glasshouse Mountains of SE Queensland at around 180 m, where it occurs in open, rocky situations. It has very small (4–5 mm long) ovate leaves with thickened margins and only 4–6 minute teeth.

At the time of preparation of my revision of the genus (Orchard, 1975) an anomalous collection from Mt Maroon, SW of Beaudesert, Queensland, was known, but its status was unclear. It was tentatively identified as a possible hybrid between *G. longifolius* and *G. teucrioides*, or a possible new species. Additional material has now been collected from nearby Mt Moon, Mt Gillies and Mt Greville, and from near Moonbi Gap in New South Wales, and it now seems clear that these collections represent another species of restricted distribution within the *G. longifolius* complex. The new species, described below, has the long silky stem indumentum of *G. longifolius*, but differs in its narrowly ovate leaves with only about 10, much coarser, teeth. The hairs on the upper surface of the leaves of *G. hirtus* are silky, spreading and dense. In *G. longifolius* in the southern part of its range the leaf hairs are relatively sparse and short, and usually more or less appressed. In the northern part of its range they are longer and more erect, but never quite as exuberant as in *G. hirtus*. The dentition of the leaves is also clinal, with southern *G. longifolius* having up to 30 small teeth per leaf, but the numbers of teeth decrease and their size increases as one moves north. However, despite these intergradations, *G. hirtus* is distinguishable by its narrowly ovate leaf shape, teeth rarely exceeding 10 per leaf, teeth about 1 mm long and coarse, and dense softly hirsute upper leaf indumentum. *G. longifolius* has narrowly oblong leaves, with (12–) 20–30 small teeth to 0.5 mm long, and subglabrous to appressed hairs on the upper leaf surface. The only other species which might be confused with *G. hirtus* is *G. humilis*, which has very short petals, and stamens reduced to 4 (usually plus 4 staminodes).

Taxonomy

Gonocarpus hirtus Orchard, **sp. nov.** Species *G. longifolium* simulans, sed foliis ovatis, (8–) 10–14 mm longis, 5–8 mm latis, dentibus usque 10 grossis et 1 mm longis, et pilis foliorum patentibus hirsutis usque 1 mm longis, differt. **Typus** (here designated): Queensland. MORETON DISTRICT. *I.R.Telford* 11987 & *J.Nightingale*, 15 Nov. 1993, Mount Greville, southeast ridge. Holotypus: CBG9313900. Isotypi (n.v.): BRI, NSW, MEL.

Weak scrambling subshrub 25–40 cm or more tall. Stems mainly annual from a persistent woody rootstock, c. 1.0–1.5 mm diam., round in section (not ribbed), reddish brown, covered with dense soft spreading (slightly antrorsely curved) hairs. Hairs c. 1 mm long, hyaline, of about 5 cells, uniseriate, seated on a very slightly swollen basal cell. Leaves opposite, becoming alternate near inflorescence, on petioles 1.5–3 mm long. Lamina dark green, narrowly ovate, (8–) 10–14 mm long, 5–8 mm wide, gradually becoming smaller towards tips of branches, soft, coarsely serrate with about 5 cuspidate teeth c. 1 mm long on each margin; margin with distinct hyaline thickening; moderately semiappressed hirsute on both surfaces with hairs as for stem. Inflorescence of flowers borne singly in axils of upper leaves (=bracts). Bracteoles reddish brown, linear-lanceolate, 1 mm long, 0.25–0.3 mm wide, tapering gradually to acute tip, densely hirsute with hairs as for stems. Flowers 4-merous, on pedicels 0.7 mm long. Sepals purplish green, narrowly oblong, 0.7 mm long, 0.3 mm wide, blunt at tip, with prominent white callus at base; margins white-hyaline, slightly thickened. Petals reddish purple, paler at margins, 7 mm long, 1.5 mm keel to margin, strongly hooded, non-unguiculate (sessile), with moderately dense hairs (as for stem) on dorsal surface. Stamens 8; filaments 0.25 mm long; anthers reddish, linear, 2 mm long, non-apiculate. Styles 4, clavate, reddish-yellow fimbriate. Ovary silvery grey, ovoid, 1.0–1.3 mm long, 0.9 mm diam., 8-ribbed with c. 3 oblique calluses between each pair of ribs, with occasional hyaline scabrous hairs on calluses and/or ribs. Fruit as for ovary, silvery grey to pale reddish purple, 1.2–1.3 mm long, 1.0 mm diam.; sepals green, persistent. **Fig. 1.**

Specimens examined**: Queensland**: MORETON DISTRICT. A.R.Bean 6647, 2.x.1993, Mt Gillies, south of Rathdowney (BRI, CANB); P.I.Forster, A.R.Bean & L.H.Bird PIF6633, 14.iv.1990, Mount Moon, 5 km SW of Mount Alford township (BRI, CANB); I.R.Telford 3525, 4.x.1973, Mt Maroon, 36 km SW of Beaudesert (CANB). **New South Wales:** NORTHERN TABLELANDS: L.M.Copeland 3277, 22.xi.2001, Stony Batter Creek Nature Reserve, c. 60 km WNW of Armidale (CANB, NE, NSW). North West Slopes: J.R.Hosking 1382 & 1385, 10.xii.1996, ~1.5 km W of Moonbi Gap (CANB, MEL, NE, NSW, TARCH).

Distribution, habitat and ecology**:** Present collections suggest that in Queensland *G. hirtus* is confined to the Moreton District, in a small area of mountains ca 50 km southwest of Brisbane, where it is recorded from "eucalypt forest with *E. dura*, *E. tindaliae*, *E. acmenoides*, shallow soil, alt. 600m." (A.R.Bean 6647), "rhyolitic rock outcrops, with *Eucalyptus dura* and *Eucalyptus acmenoides*; alt. 600 m" (P.I.Forster et al., PIF6633), "dry sclerophyll forest on rocky slopes, alt. c. 700 m altitude" (I.R.Telford 3525), and "rocky ridge, SE aspect, skeletal soil on trachyte, shrub community, *Eucalyptus notabilis* (mallee habit), *Westringia sericea*, *Leptospermum* spp., alt. 350 m." (I.R.Telford 11987 & J.Nightingale). In New South Wales it is known from the North Western Slopes and Northern Tablelands regions in "shrubland on brown silt and sand over granite at 790 m." (J.R.Hosking 1382 & 1385) and "shallow sandy loam amongst boulders; layered woodland dominated by *Eucalyptus andrewsii* and *E. prava*; 920 m." (L.M.Copeland 3277). It flowers October–November, and fruit is present until April.

Key to related species

The following key is based on leads 10 to 15 in Orchard (1990), with the addition of *G. teucriodes* and *G. hirtus*. *G. chinensis* is included because it is a species of northern Queensland and the Northern Territory, but is not part of the complex under discussion.

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1. Stamens 4, opposite sepals; staminodes 4 . . . . **G. humilis**
   Stamens 8, all functional 2

2. Subshrub usually 50–100 cm tall; main stems distinctly woody 3
   Perennial herb usually less than 35 cm tall; main stems herbaceous or only slightly woody 7

3. Bracts of inflorescence opposite, at least at base; bracteoles green, fleshy, concealing ovary; indumentum of young stems and leaves of stiff scabrous hairs 0.2–0.5 mm long, seated on swollen multicellular bases . . . . **G. teucrioides**
   Bracts of inflorescence all alternate; bracteoles red-brown, membranous, much smaller than ovary; indumentum of young stems and leaves long (to 1 mm) and soft, or if shorter and stiff, not seated on swollen multicellular bases 4

4. Leaves and young stems with dense indumentum of soft, spreading 2–5-celled hyaline hairs 0.3–1 mm long 5
   Leaves and young stems with sparse to dense indumentum of stiff, spreading 1–2-celled hyaline hairs 0.1–0.3 mm long 6

5. Leaves linear-oblong, (1.3–) 1.5–2.5 (–3.2) cm long, 0.3–0.6 cm wide, with (12–) 20–30 teeth to 0.5 mm long .... **G. longifolius**
   Leaves narrowly ovate, 0.8–1.4 cm long, 0.5–0.8 cm wide, with ca 10 teeth to 1 mm long .... **G. hirtus**

6. Indumentum dense, velvety; leaves ovate to oblong, 1.0–3.5 cm long ...... **G. oreophilus**
   Indumentum sparse, scabrous; leaves ovate, 0.4–0.5 cm long .... **G. effusus**

7. Indumentum of young stems and leaves soft, spreading; leaves narrowly ovate .. **G. hirtus**
   Indumentum of young stems and leaves stiff, scabrous, appressed; leaves lanceolate to linear-lanceolate 8

8. Leaves lanceolate, widest near centre; leaves, bracts, bracteoles and sepals lacking prominent white thickened margins; indumentum of young stems and leaves moderately dense, even, appressed, of stiff, straight unicellular hairs 0.2–0.3 mm long .... **G. tetragynus**
   Leaves linear-lanceolate, widest towards base; leaves, bracts, bracteoles and sepals with prominent white thickened margins; indumentum of young stems and leaves sparse, appressed, scabrous, of curved 1–2 celled hairs 0.2–0.3 mm long .... **G. chinensis**

***Etymology*:** The epithet 'hirtus' refers to the long soft spreading indumentum of the young stems and leaves, which this species shares with *G. longifolius*.

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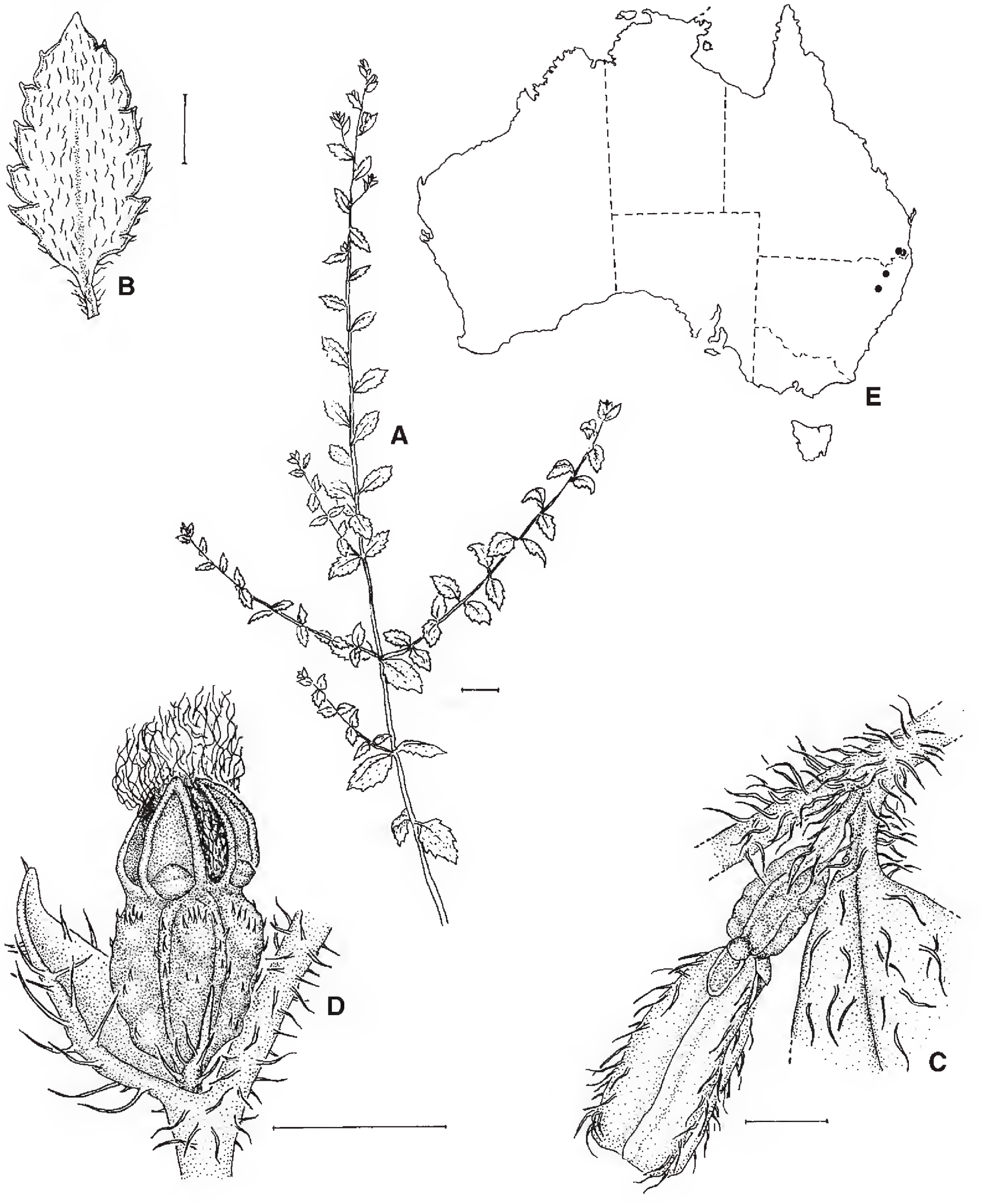

Fig. 1. ***Gonocarpus hirtus***. A. Habit. B. Leaf. C. Flower in axil of bract. D. Fruit. E. Distribution. (A–C. Telford 3525; D. Forster, Bean & Bird PIF6633). Scales represent 1 cm (A), 5 mm (B), 1 mm (C, D).

Taxonomic notes on palms (Arecaceae) in catalogues of the Brisbane Botanic Garden, Australia, of 1875 and 1885

John Leslie Dowe

Summary

Dowe, John Leslie (2004). Taxonomic notes on palms (Arecaceae) in catalogues of the Brisbane Botanic Garden, Australia, of 1875 and 1885, *Austrobaileya* 6 (4): 967–972. Two catalogues of plants cultivated in Brisbane Botanic Gardens, Queensland, Australia, namely W. Hill's *Catalogue of the plants in the Queensland Botanic Gardens*, published in 1875, and F. M. Bailey's *Catalogue of plants in the two metropolitan gardens, the Brisbane Botanic Garden and Bowen Park (The Garden of the Queensland Acclimatisation Society),* published in 1885, were studied in regards to palm nomenclature. Citations and notes are provided for the entries *Desmoncus minor, Jubaea speciosa, Pinanga smithii* and *Sagus blackalli.*

Keywords: Arecaceae, Brisbane Botanic Garden, W. Hill, F.M. Bailey

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Introduction

While investigating the taxonomy of Australian palms for the Flora of Australia treatment, I examined two catalogues of the plants that were being grown in Brisbane Botanic Garden, Queensland, Australia. These catalogues, published in 1875 and 1885 respectively, listed both economically important and ornamental species. Each catalogue was prepared in a systematic format, with that by Hill (1875) arranged according to Lindley (1836), the *Natural System of the Vegetable Kingdom,* while the other by Bailey (1885) was arranged in the system of Bentham and Hooker (1862–1883) as used in their *Genera Plantarum*. Both catalogues were produced in hardbound editions and widely distributed. In this paper I will discuss the nomenclatural and taxonomic implications of names in publications such as botanic garden plant catalogues (see Mabberley, 1983; Ewan, 1993), with reference to the International Code of Botanical Nomenclature (ICBN) (Greuter *et al*., 2000). The introduction and perpetuation of misapplied names, both legitimate and illegitimate, to some palms in a horticultural context, have been recognised (Moore, 1971; Zona, 1990). Four names of palms that appeared in Hill's catalogue are discussed, and their nomenclatural status reconciled.

Walter Hill's Catalogue of 1875

Walter Hill (b.1820, d.1904) was appointed as the first Superintendent of Brisbane Botanic Gardens in 1855, first Queensland Colonial Botanist in 1859, and retained both positions until 1881 (Orchard, 1999). In Hill's (1875) catalogue, the palm family is termed '*Palmaceae*', the name used by Lindley (1836), but now considered an obsolete name. The total number of plant names included in the catalogue was about 10 000. This number comprised many hundreds of cultivar names. *Pyrus* and *Malus* cultivars alone numbered almost 300 entries. The catalogue presented information in a tabulated form with the column headings 'Systematic name, and authority'; 'English or local name'; 'Habit'; and 'Locality'.

The catalogue listed 155 names of palms in 44 genera. Of these 46 (30%) are valid names in current use. All but four of the remaining 119 names are recognised as validly published synonyms of otherwise valid names in current use. Therefore, 151 of Hill's names can be nomenclaturally reconciled. Three of the four names - '*Desmoncus minor* R. et P.', '*Jubaea speciosa* H. K.' and '*Sagus blackalli* W. H.' – do not appear on available taxonomic databases (Chapman, 1991; Index Kewensis, 1993; IPNI, 1999; APNI, 2001; TROPICOS, 2001); the fourth name, '*Pinanga smithi* W. H.', did not appear in either Chapman (1991) or APNI (2001), but was present in Index Kewensis

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(1993) and IPNI (1999).

Names published in systematically arranged lists, such as Hill's catalogue, become part of the taxonomic literature and may be accounted for in subsequent accounts and revisions (Barker and Barker, 1990). However, the validity of a name is dependent upon there being a description that, ideally, allows recognition of the species, or if there is a reference to a specimen that provides identity for the name. Illegitimate names are rejected according to the rules in the ICBN (Greuter et al., 2000). However, such names may be accounted for in subsequent taxonomic treatments of Australian palms, albeit within the *nomina dubia et excludenda* section.

A search was instigated of the two herbaria, BRI and MEL, where Hill was known to deposit most of his specimens, but no specimens related to any of the obscure names were located. A search was also made of the records of the Brisbane Botanic Garden, but apart from the original citation in the catalogue, no further evidence of the names was revealed. In regards to those names in genera of American palms, i.e. *Desmoncus minor* and *Jubaea speciosa*, the records of the following herbaria were examined: MO, NY, TRIN and US.

Frederick Manson Bailey's catalogue of 1885

Frederick M. Bailey (b.1827, d.1915) succeeded Hill as Queensland Government Botanist in 1881, a position that he held until 1915 (Orchard, 1999). In Bailey's (1885) catalogue, the palm family is referred to as the *Palmae*, a name now conserved along with *Arecaceae* as a valid alternative name (Greuter *et al.*, 2000). The number of names in all families in Bailey's catalogue was reduced to about 3000, mainly due to the absence of cultivar names. However, it included additional information about the plants, with "*...numerous notes on the properties and uses of the plants (are) a feature the compiler feels sure will be appreciated by a large number of persons, especially by those who take a utilitarian view of them*". Unlike Hill's catalogue, Bailey's catalogue did not have a tabular format, but it did include utilisation notes following many entries, as well as concise information on habit and origin. Considering the palms, Bailey included 91 names compared to Hill's 155, but more generic names, 57 as compared to 44. There were several reasons for these changes. A primary reason for the reduction in species names would have been due to the demise of those species that were culturally inappropriate for the warm temperate climate of Brisbane. Bailey had also implemented synonymy where required, and had adopted many of the new generic names that were the result of revisions that had been completed in the decade since Hill's catalogue was published. For example, the 13 species previously listed under the single genus name *Areca* in Hill's catalogue were subsequently included in seven genera in Bailey's catalogue, while the six species in Hill's *Kentia* were divided into five genera in Bailey's catalogue. These two genera alone accounted for an increase of ten generic names.

Taxonomy and nomenclature

The decade 1875–1885 was one of considerable activity in Australian palm taxonomy. Wendland and Drude (1875) published the first detailed account of Australian palms in their *Palmae Australasicae*, Bentham (1878) published his account of palms in volume seven of *Flora Australiensis*, and Mueller (1875–1881) had entered his most active period of palm taxonomy. The nomenclatural changes introduced by these accounts were reflected in the names used in Bailey's 1885 catalogue, when compared to Hill's catalogue of ten years earlier. A comparison can be made between the numbers of names that are in current use that were used in each catalogue. Whereas only 30% (46 of 155) of the names that Hill used are in current use, 56% (51 of 91) of the names used by Bailey are in current use. For example, Hill listed *Ptychosperma elegans* under two names - *Pinanga smithii* and *Seaforthia elegans* - and *Caryota mitis* also under two names - *C. furfuracea* and *C. sobolifera*. However Bailey listed *Ptychosperma elegans* only once and under its 'new' name, and only *Caryota sobolifera* for the two *Caryota* names. Bailey adopted all the name changes in the accounts of Wendland and Drude, Bentham and Mueller, among others, and was also more conservative in his use of 'obscure' names than was Hill.

Obscure and neglected names in Hill (1875)

'*Desmoncus minor*, R. et P.': in W. Hill, Catalog. pl. Brisbane bot. gard. 21 (1875), 'evergreen climber, Trinidad'.

Attributing authorship of this name to Ruiz and Pavon, I propose, is an error. The palm taxonomy of these botanists is primarily confined to two publications (Ruiz and Pavon, 1794, 1798) in which they named 16 species (Henderson, 1995; IPNI, 1999). Their taxonomic activity occurred three decades prior to the establishment of *Desmoncus* by Martius (1824), so they could not have had any connection with the taxonomy of that genus using that name. According to Uhl & Dransfield (1987), *Desmoncus* has not received a recent critical revision, and much of the nomenclature of the genus is unresolved. Apart from appearing in Hill's catalogue, the name also appears on a specimen held at TRIN. The specimen is *Broadway* 5568, the type for *Desmoncus prestoei* L. H. Bailey (= *D. polyacanthus* Mart.), collected in 1891 from a plant cultivated in the Trinidad and Tobago Botanical Garden. The name *Desmoncus minor* is therefore most likely related to plants growing in Trinidad and Tobago Botanical Gardens. Hill probably received material under this name from Trinidad as part of the exchange program with Brisbane Botanical Gardens.

Bailey (1943), in describing *Desmoncus prestoei* L. H. Bailey, noted that the name *D. minor* Prestoe appeared in "...the Hart catalogue [of 1908]... without description or comment...", and was the name proposed by Prestoe for the Broadway specimen mentioned above. Bailey referred to *D. minor* as a *nomina nuda* and later (Bailey, 1947) as a "floating herbarium name", and therefore determined that it could not be taken up either as a name or synonym. According to Article 7.1 [no type] and Article 32.1 [no diagnosis or reference to previous effective publication] in the ICBN, (Greuter *et al.*, 2000), the name '*Desmoncus minor*' is to be rejected.

'*Jubaea speciosa* H. K.': in W. Hill, Catalog. pl. Brisbane bot. gard. 23 (1875), 'evergreen tree, Mauritius'.

Kunth (1816) described *Jubaea spectabilis* Kunth (= *J. chilensis* (Molina) Baillon) for a species growing in Chile. A search of the available databases was unable to detect the combination '*Jubaea speciosa*'. The epithet '*speciosa*' is suspected to be an orthographic misinterpretation of '*spectabilis*'. Plants of *J. chilensis* are extant in City Botanic Gardens, Brisbane, and are assumed to have been acquired during the years in question. According to Article 60.1 [incorrect spelling] in the ICBN, (Greuter *et al.*, 2000), the name '*Jubaea speciosa*' is to be rejected.

'*Pinanga smithi* W. H.': in W. Hill, Catalog. pl. Brisbane bot. gard. 20 (1875); Scheffer, Ann. Jard. Bot. Buitenzorg 1: 154 (1876) [as *Pinanga smithii*]; J. D. Hooker, Bot. Mag. 3rd ser., 50: t. 7345 (1894); Martelli, Nuovo Giorn. Bot. Ital. ser. 2, 42: 72 (1935) = ***Ptychosperma elegans*** (R.Br.) Blume.

Type citation: 'evergreen tree, Cape York'. Type: Cultivated plant in Brisbane Botanic Garden, not extant.

The name *Pinanga smithii*, included within the tribe *Areceae*, first appeared in Hill's 1875 catalogue. Scheffer (1876, p. 154) related the name to *Ptychosperma elegans*: "...nous avons reçu ce palmier du jardin botanique de Melbourne, sous le nom de *Pinanga Smithii*.". Scheffer provided a description based upon those plants. Subsequently, Index Kewensis did not reference the name to Hill, but to Scheffer.

Beccari (1885), in discussing palms that were growing in Bogor Botanic Gardens, reconfirmed the identity of *Pinanga smithii* as *Ptychosperma elegans*, though he described his specimen as a subspecies, *P. elegans* var. *sphaerocarpa* Becc. Beccari provided a diagnostic illustration that allows identification as *P. elegans*. Hooker (1894) subsequently used *P. smithii* in synonymy under an illustration of *P. elegans* in Curtis's Botanical Magazine. The source material for the illustration was a plant in the Royal Botanic Gardens Kew, but its origin was not noted as there was no available record of its introduction. Hooker supposed that the epithet '*smithii*' originated in "...some continental gardens to which a young plant had been contributed from Kew, and to which was given the name of the late Curator of that establishment, whose success as a raiser of palms was famous". The Smith to whom Hooker most likely referred, was John Smith (b. 1798, d. 1888), the first curator of the Palm House at Kew (1841–1864) (Turrill, 1959; King, 1985; Minter, 1991). However, this version of the origin of the epithet appears to have been only speculation by Hooker. Hill and Scheffer did not provide any information in this regard. Hill indeed cited himself as the author in the first publication of the name.

The most recent use of the name was by Martelli (1935), who included it in a list of species names in the Areceae, but indicated that it was a synonym of *Normanbya muelleri* (W.Hill) Becc. (= *Normanbya normanbyi* (W.Hill) L.H. Bailey), a determination that was clearly incorrect. A search of the records of the Melbourne Botanic Gardens' living plant censuses, the National Herbarium of Victoria collection (MEL) and the index of plant names in the Mueller Correspondence Project, did not reveal the name *Pinanga smithii* (C. Coles and F. Anderson, pers. comm.). However, a specimen determined as *P. elegans* by Mueller in MEL, was despatched by Hill to Mueller in June 1875, and accompanied by a letter that described the palm as "...found by me at Cape York... the habit resembles the *Seaforthia elegans*, and grows about the same height."

In recent accounts, the name *Pinanga smithii* has ceased to be used, and it does not appear, to my knowledge, in any relevant taxonomic accounts after 1935 such as Moore (1963), Essig (1978), Chapman (1991) or APNI (2001). The name *Pinanga smithii* has evidently become neglected, but as a legitimate synonym should be included under *Ptychosperma elegans*, and with the following authorship, *Pinanga smithii* W.Hill ex. Scheff.

'*Sagus Blackalli* W. H.': in W.Hill, Catalog. pl. Brisbane bot. gard. 21 (1875), 'evergreen tree, Cape York'. It is probable that the etymology of this name was to honour Samuel Wensley Blackall, Governor of Queensland, 1868–1871.

The name *Sagus blackalli*, included within the tribe Calameae, was, to my knowledge, only ever used in Hill's catalogue, where it was noted as an 'evergreen tree, Cape York'. It is absent from all plant name databases known to me. It is not known if Hill had intended to describe a species under this name, as no specimens or correspondence to that effect have been located.

Sagus Steck is now a synonym of *Metroxylon* Rottb. and *Sagus* Gaertn. a synonym of *Raphia* Beauv. The name *Sagus* was replaced by those new generic names many decades before Hill's catalogue appeared. This lends credence to the possibility that Hill had not intended to use *Sagus*, but he used that spelling inadvertently for another genus. One possibility is that he had meant to use the name *Saguerus* Steck, now a synonym of *Arenga* Labill. Wendland and Drude (1875) described *Saguerus australasicus* H. Wendl. & Drude (= *Arenga australasica* (H. Wendl. & Drude) S. T. Blake) from Cape York, but whether Hill had intended any connection with that genus, albeit as being misspelt, is not known. It is assumed that the monograph on Australian palms by Wendland and Drude (1875) was not yet available to Hill, although it cannot be discounted that he was aware of proposed manuscript names. Hill placed *S. blackallii*, along with two other species of *Sagus*, in the Tribe Calameae, which is the correct systematic placement for *Sagus* and its synonyms, whereas he placed his *Arenga* species in the tribe Areceae. If he had intended the name to be *Saguerus*, it would have been more than likely that he would have placed *S. blackalli* at least near *Arenga* in the list, as it was a systematic rather than alphabetic arrangement. However, without specimens or documentation, it is only speculation that Hill had intended otherwise. According to Article 7.1 [no type], Article 9 [identity ambiguous] and Article 32.1 [no diagnosis or reference to previous effective publication] in the ICBN, (Greuter *et al.*, 2000), the name '*Sagus Blackalli*' is to be rejected.

Summary

Nelson (1990), in commenting on the taxonomic and nomenclatural implications of names published in plant catalogues and otherwise described from cultivated specimens, highlighted the problems that may arise when such publications are overlooked, particularly in relation to obscure names, or names that otherwise may have become neglected. Plant catalogues and similar publications cannot be ignored as sources of taxonomic and nomenclatural information.

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Notelaea ipsviciensis (Oleaceae), a new species from south east Queensland

Wayne K. Harris

Summary

Harris, W.K. (2004). *Notelaea ipsviciensis* (Oleaceae), a new species from south east Queensland. *Austrobaileya* 6 (4): 973–976. *Notelaea ipsviciensis* is described and notes are provided on its habitat, distribution and conservation status. It is found in a very restricted area of south east Queensland.

Key words: Queensland, Oleaceae, *Notelaea ipsviciensis*.

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Introduction

The genus *Notelaea* Vent., in Queensland comprises 11 species, three of which are new. During studies on the systematics of *Notelaea* and related genera in the southwest Pacific, Lloyd Bird of Bundamba, brought to my attention a rare and unusual form in the genus, which appeared to be restricted to the Ipswich area. This species is here described as new. The most notable features of this species were its habit and leaf venation in which the secondary venation arises more or less at right angles from the mid-vein. The full taxonomic treatment of the genus is to be published separately.

Notelaea ipsviciensis W.K.Harris, **sp. nov** affinis *N. ovatae* sed foliis lanceolatioribus (ovata in *N. ovata*) et venatione secundaria sub angulo paene 90° abeunti (adversus angulum acutiorem in *N. ovata*) differt. **Typus:** Queensland, Moreton District: Rhondda Collieries, Bergen's Hill, Bundamba, Ipswich, Aug 1985, *Bird* s.n., (holo: BRI, [AQ 442082]). **Fig. 2**.

Notelaea sp. (Bundamba L.H. Bird AQ442082) in Henderson (2002).

Evergreen shrubs 0.5–1.5m tall, multi-stemmed, forming lignotubers, stems erect or ascending 2–4 cm in diameter: bark pale grey, smooth. Branchlets puberulent with erect simple hairs, glabrescent. Leaves glabrous except puberulent base and midrib; lamina coriaceous, oblanceolate to narrow lanceolate, punctate above and below, punctae often more prominent on abaxial surface, 4–8 cm long, 0.8–1.2 cm wide (length/ breadth ratio 7.5 –10:1); margin entire, slightly recurved: apex acute to acuminate; base narrow cuneate to attenuate into the petiole; venation distinct and prominently raised above and below, tertiary venation distinct, secondary veins 9–12 pairs; juvenile leaves lanceolate, 6–10 cm long and 0.8–1.2 cm wide. Inflorescence axillary, up to three per axil, metabotryoids, 5–9 -flowered, 1–2.5 cm long; axes puberulent, sometimes glabrous apically; bracts ovate to acute, sparsely puberulent on the outside, glabrous on the inside, 1–1.2 mm long, persistent; bracteoles linear to lanceolate, sparsely puberulent on the outside, glabrous inside, 0.8–1.2 mm long, caducous. Flowers, pale cream to yellow; pedicels sparsely puberulent to glabrous, articulate at base, 2–6 mm long. Sepals 4, glabrous or ciliolate at the apex, triangular, apex acute to apiculate, 0.2–0.5 mm long, 0.4–0.6 mm wide. Corolla induplicate-valvate in bud, 4-lobed; lobes ovate, concave, 1–1.8 mm long, 0.9–1 mm wide, joined in pairs above the base of the filaments for c. 0.5 mm, glabrous. Stamens 2, glabrous, enclosed within the concave corolla segments; filaments c. 0.2 mm long with a blunt terminal umbo; anthers 1–1.5 mm long, 1.2–1.4 mm wide. Ovary glabrous, flask shaped, 0.6–1 mm long at anthesis; style c. 0.1 mm long; stigma shortly 2-lobed, yellow-brown, c. 0.3 mm long. Drupe dark blue to purple when ripe, ovoid, 8–10 mm long, 6–8 mm diameter; mesocarp c. 1 mm thick; endocarp woody, c. 0.4 mm thick. **Fig. 1.**

Specimens studied: Queensland. Moreton: Ipswich Bundamba 1km S of Barclay St Rhondda Colliery Land, 27.62°S, 152.80°E, Nov 1987, *Bird, s.n.*, [AQ 436255] (BRI); Ipswich Bundamba Bergens Hill Rhondda Colliery, 27.25°S, 151.91°E, Nov 1985, *Bird, s.n.*, [AQ 441680] (BRI); Ipswich Bundamba 1km S of Barclay Stn Rhondda

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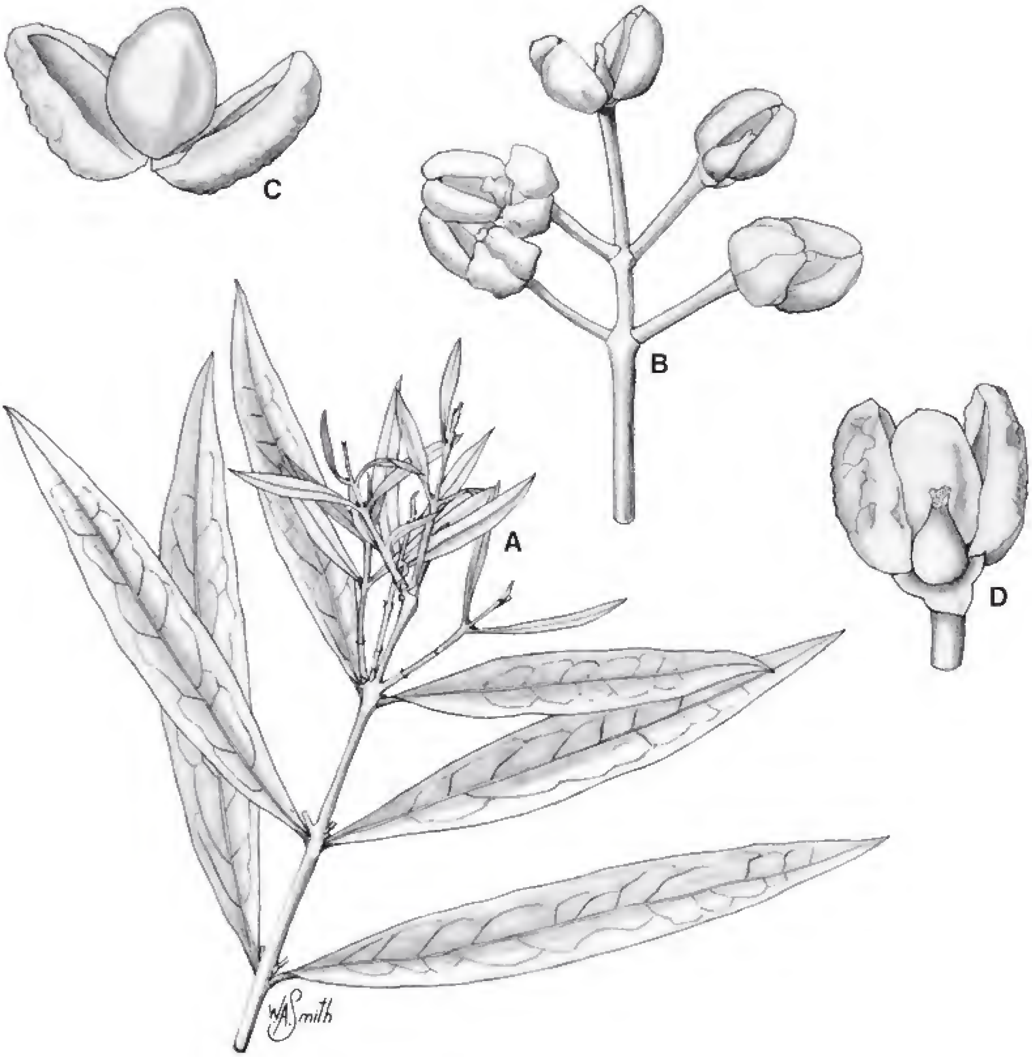


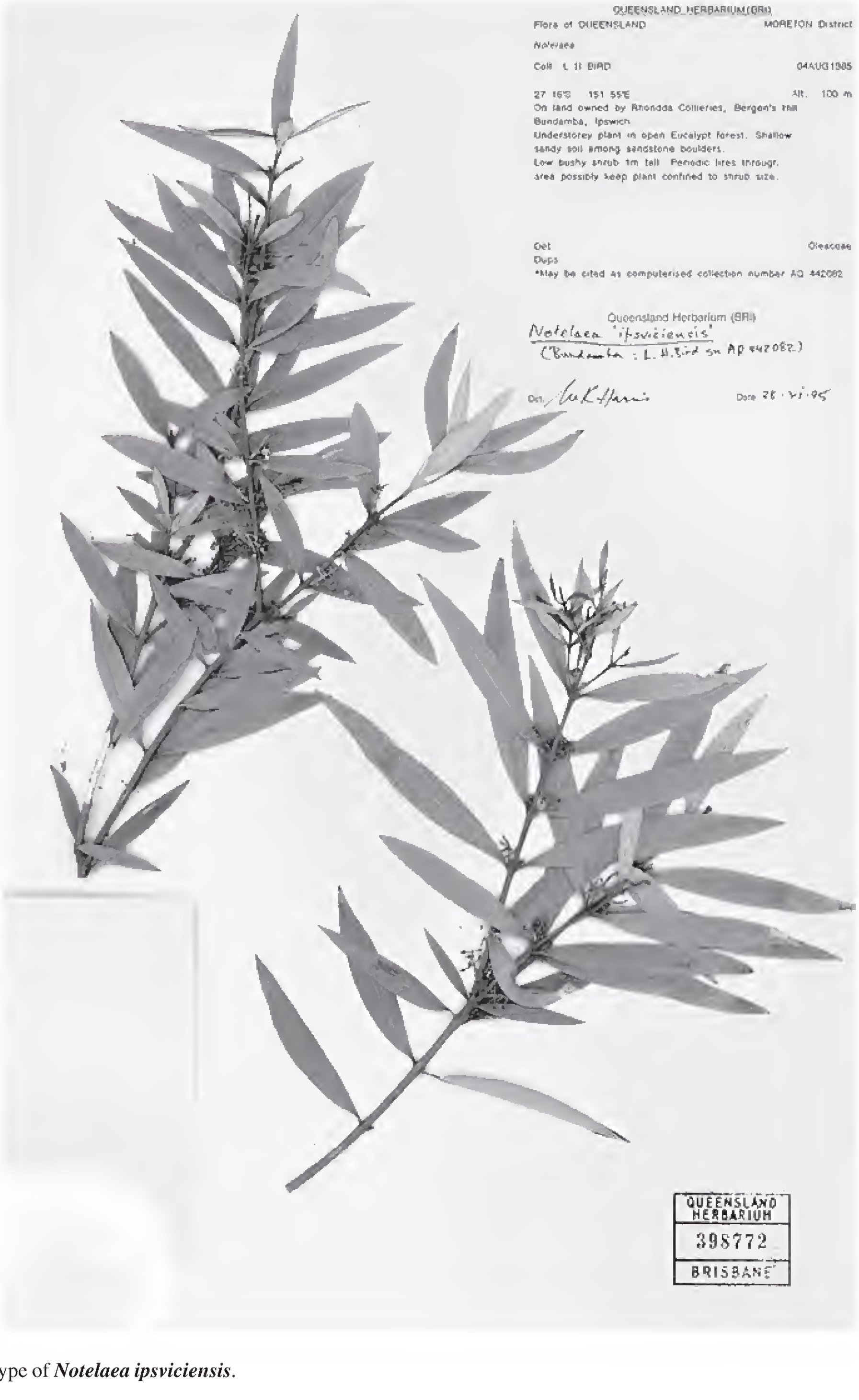
Fig. 1. ***Notelaea ipsviciensis***. A. leafy shoot × 1. B. inflorescence × 4. C. Flower × 8. D. Section of flower × 8. *Bird s.n.* AQ 489221 (BRI).

Colliery, 27.25°S, 151.91°E, Dec 1985, *Bird, s.n.,* [AQ 441681] (BRI); Ipswich Dinmore, 27.62°S, 152.79°E, Aug 1985, *Bird, s.n.,* [AQ 442081] (BRI); Ipswich Bundamba Rhondda Colliery land end of Barclay St, 27.60°S, 152.82°E, Nov 1988, *Bird, s.n.,* [AQ 453056] (BRI); Ipswich 2km SE of Bundamba, 27.60°S, 152.82°E, Oct 1988, *Bird, s.n.,* [AQ 454151]; Whitewood Road Ebbw Vale Ipswich 400m E of the road, 27.62°S, 152.79°E, Jun 1996, *Bird, s.n.,* [AQ 489221] (BRI); 1km S of Dinmore, 27.58°S, 152.91°E, Jun 1996, *Bird, s.n.,* [AQ 586175] (BRI).

Distribution and ecology**:** Confined to a very few localities in the Ipswich area of southeast Queensland, where it occurs in dry sclerophyll eucalypt forest.

Phenology**:** Flowers appear in winter in July and fruits appear shortly after and are mature by October.

Notes**:** This species has its closest affinities with *N. ovata* but it differs from this species in having lanceolate leaves and a distinct venation pattern with the secondary venation on mature leaves arising close to 90° from the mid-rib. It is possible that this species is a hybrid between *N. lloydii* Guymer and *N. ovata* R.Br. *N. lloydii* grows in close proximity but the other putative parent does not occur in the immediate vicinity.



QUEENSLAND HERBARIUM (BRI)
Flora of QUEENSLAND MORETON District
Notelaea
Coll L. H. BIRD 04AUG1985
27 16'S 151 55'E Alt. 100 m
On land owned by Rhondda Collieries, Bergen's Hill
Bundamba, Ipswich.
Understorey plant in open Eucalypt forest. Shallow
sandy soil among sandstone boulders.
Low bushy shrub 1m tall. Periodic fires through
area possibly keep plant confined to shrub size.

Det Oleaceae
Dups
*May be cited as computerised collection number AQ 442082

Queensland Herbarium (BRI)
Notelaea 'ipsviciensis'
(Bundamba : L. H. Bird sn AQ 442082)

Det. W K Harris Date 28 · xi · 95

QUEENSLAND HERBARIUM
398772
BRISBANE

Fig. 2. Type of ***Notelaea ipsviciensis***.

***Conservation status*:** This species was probably more widespread in the Ipswich district but is now known from only two localities with a total of about twelve plants. It therefore satisfies several criteria of the IUCN (Anonymous 2001) categories of rare and threatened plants, especially population size of less than 50 individuals surviving in the wild and a decline in area of occupancy such that the population has been severely fragmented. It is suggested that the species is critically endangered with an IUCN category of CR

***Etymology*:** The specific epithet is a derivation of the name of the nearby city of Ipswich.

Acknowledgements

I am indebted to Lloyd Bird of Ipswich for his encouragement and company in the field. Will Smith (BRI) provided the illustrations of this species. Les Pedley provided the Latin translation of the diagnosis.

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Note

A new combination in *Centratherum* Cass. (Asteraceae)

Centratherum is a small genus in the tribe Vernonieae, subtribe Centratherinae. It was characterised by Robinson et al. (1980) by the leafy outer involucral bracts, long-stalked glands on the corolla, and the pappus being short and caducous, or absent.

It occurs mainly in South America, but it does occur in the Philippines and in Australia. Two taxa occur in Australia; one is native and the other introduced (Kirkman 1981).

Bentham (1867) identified the Australian taxon as *C. muticum* (Kunth) Less. (based on *Ampherephis mutica* Kunth), and this name was applied to Australian material for many years. Kirkman (1981) placed *C. muticum* in the synonymy of *C. punctatum* Cass., a South American species. The type of *Ampherephis mutica* was collected in South America. From the detailed illustration and description included in the protologue, it is clear that *C. muticum* is a synonym of *C. punctatum sens. str.*

Kirkman (*loc. cit.*) described *C. punctatum* subsp. *australianum* for the Australian taxon. However, I consider species rank is appropriate (see below). I have been unable to find any prior species name applicable to the Australian taxon.

Centratherum australianum (K.Kirkman) A.R.Bean, **comb. et stat. nov.** *C. punctatum* subsp. *australianum* K.Kirkman, Rhodora 83: 21 (1981). **Type:** New South Wales. NORTH COAST: west of Wingham on Bulga road, 12 April 1953, *J. Vickery* 23846 (holo: NSW; iso: L (photo!), MO, *n.v.*).

C. punctatum and *C. australianum* are similar in several respects. They both have: dimorphic involucral bracts, with the outer ones foliaceous; T-shaped hairs on the branchlets (although the 'stalk' is often obsolete in *C. australianum*); caducous pappus comprising sub-plumose ensiform bristles (terminology from Bean 2001); and longitudinally 10-ribbed cypselas. However, they are readily distinguished by several characters (outlined in the key). Furthermore, they originated in different continents, with no opportunity for genetic interchange.

Key to *Centratherum* species in Australia

Leaves oblanceolate, with 1–8 pairs of obtuse teeth, occasionally entire; capitulum 8–14 mm diameter; corolla tube glabrous or with a few sessile glands; pappus bristles with <50 pectines, each c. 0.05 mm long . . . . . . **C. australianum**

Leaves obovate, with 10–18 pairs of acute teeth; capitulum 20–25 mm diameter; corolla tube with sessile glands and stalked glands to 0.15 mm long; pappus bristles with >100 pectines, each 0.1–0.15 mm long . . . . . . ***C. punctatum**

C. australianum is undoubtedly a native Australian plant. It was collected in 1804 by Robert Brown at 'Port Jackson' (now Sydney), and by other pioneer collectors. I have observed it growing in intact non-weedy eucalypt forest away from roads and other disturbance. It is distributed in coastal eastern Australia from Sydney, N.S.W. to Shoalwater Bay, Qld. The alleged occurrence in the Northern Territory shown by Kirkman (*loc. cit.*) is erroneous.

C. punctatum sens. str. was introduced to Australia as an ornamental plant in the mid-20th century, and has become sparingly naturalised in northern Australia, from Kununurra, W.A. to Murwillumbah, N.S.W.

Both species are illustrated in the Flora of New South Wales (Porteners 1992).

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Note

Nomenclatural changes for two Australian species of *Livistona* R. Br. (Arecaceae)

The treatment of Arecaceae for the Flora of Australia is presently being prepared. Taxonomic considerations related to the treatment are being dealt with in advance of publication, and proposed name changes of two Australian *Livistona* species are presented here.

Livistona decora (Bull) Dowe **comb. nov.** *Corypha decora* W. Bull, Catal. (1887) 10. **Type:** Australia. Queensland, Yepoon–Emu Park Rd, c. 11 km S of Yepoon, *A.N.Rodd* 3069 with *S.Jacobs*, 12 May 1976 (neo: BRI; isoneo: BH, K, NSW, here designated).

Livistona decipiens Becc., *Webbia* 3 (1910) 301, **syn. nov. Type:** France. Cultivation. Nice, May 1908, *A.Robertson-Proschowsky* s.n. (lecto: FI) (fide Rodd, 1998).

[*Livistona inermis auct. non* R.Br., Wendland and Drude, Linnaea 39 (1875) 229, *pro. part.*]

[*Livistona australis auct. non* (R.Br.) Mart., Bentham, Fl. Austral. 7 (1878) 146, *pro. part.*]

Livistona decipiens var. *polyantha* Becc., Webbia 5 (1921) 15, 18. **Type:** Indonesia. Cultivation. Bogor Botanic Gardens, undated, *Beccari* s.n. (holo: FI; iso: BO).

The new combination for this species is based on the name *Corypha decora* W. Bull, which was first used by Bull (1887) for plants that were grown in his nursery at Chelsea, England, and subsequently discussed by Watson (1889) in a paper on the cool cultivation of tropical and subtropical plants. Bull's (1887, p.10) description was: "*Corypha decora*: An elegant and ornamental species introduced from Queensland. It early develops characterized leaves, which are fan-shaped in outline and divided almost to the petiole into linear lanceolate segments each about half-an-inch in breadth. The petioles are sparsely furnished with small hooked prickles. This species will undoubtedly be found one of the most useful of greenhouse palms". Watson's (1889, p. 294) account of this palm, which he incorrectly identified as *L. inermis* R.Br., included: "...The most interesting of this genus, however, is a very fine example of the rare *L. inermis* of R.Brown, in the gardens of Villa Valetta. It has a bare stem 6 feet high by 1½ feet in diameter at the base. The head is made up of a large number of shining green leaves, the petiole of which is 6 feet long and margined with spines at the base. The blade is divided almost to the base, and it has a distinct midrib that is curved so as to produce a very extraordinary effect. The form of the leaf may be called a combination of the pinnate and palmate characters. A plant of this rare palm is in the Kew collection; there is also a fine example of it in the collection at Blenheim. A large specimen was also noted in Baron Vigier's garden at Nice. Mr Bull distributed plants of it some years ago under the name of *Corypha decora*".

The validation of the name *C. decora* precedes that of *L. decipiens*, and therefore has priority over it. The descriptions provided by Bull and Watson are attributable to the taxon. The place of publication is also acceptable as the rules of nomenclature allow for the validation of names published under such circumstances.

Beccari (1910) was apparently unaware of the use of the name *Corypha decora* when he named *Livistona decipiens* from the collection of *Robertson-Proschowsky* s. n. [FI] taken from a cultivated plant at Nice, France, and named for the deception that it had caused as to its true identity: "*...il nome di L. decipiens, per gli errori di cui è stata causa...*". In cultivation in the Riviera during the late 1800s it had incorrectly been referred to by local horticulturists as '*Copernicia cerifera*', and it was with the intention of clarifying the species' identity that Beccari provided the description and established the name. Although unaware of its origin, but suggesting that it came from eastern tropical Australia, Beccari (1921, 1931) related it to other Australian species, primarily *L. australis.* Despite it being well known and widely cultivated throughout the world, its

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native origin continued to remain speculative until relatively recent times. For example, Bailey (1976) noted (with reference to the name *L. decipiens*): "...described from cult., supposedly Australian...". The first unequivocal application of *L. decipiens* to natural populations was by Johnson (1981) who recorded distribution of the species from Miriamvale to Townsville in Queensland.

Through a lack of understanding of the correct identity of *L. inermis*, and the incorporation of characteristics of misidentified specimens of other species into descriptions, *L. decora* was inadvertently identified as that species in a number of instances. Both Wendland and Drude (1875) and Bentham (1878) cited the MEL *Thozet* s.n. specimen from Moore's Creek near Rockhampton, central Queensland (now known to be of *L. decora*) in their accounts of *L. inermis* R.Br. and *L. australis* (R.Br.) Mart. respectively. Upon this basis, many specimens in both the wild and in cultivation with a deeply segmented leaf were identified as *L. inermis sensu* H.Wendl. (Hill, 1873, 1875). It is highly probable that *L. inermis* R.Br. in the strict sense was never in cultivation in Europe as it is an exceedingly difficult plant to propagate and maintain while *L. decora* seed is easy to germinate, and the plants are one of the fastest growing species of *Livistona*. The specimen *A.N.Rodd* 3069 with *S. Jacobs*, collected from the Yepoon–Emu Park Rd, c. 11 km S of Yepoon at BRI is chosen as the neotype as it is from the area where seeds may originally have been collected for distribution to England and Europe.

Livistona nasmophila Dowe & D.L. Jones **nom. & stat. nov.** *Livistona mariae* subsp. *occidentalis* A.N. Rodd **syn. nov.**, Telopea 8: 81 (1998). **Type:** Australia. Western Australia, Durack Range, SE base of Mt King, *A.N. Rodd* 2868 (holo: NSW; iso: BH, K, PERTH, QRS).

Rodd (1998) established this taxon as *L. mariae* subsp. *occidentalis* A.N.Rodd, based on the NSW collection *A.N. Rodd* 2868 from Mt King, Western Australia. In the prologue, Rodd wrote: "Recognition of this population as a separate subspecies on the basis of a single wild collection (and one from cultivation) is arguably rather premature". Following fieldwork in the Kimberleys, with collections of fruit and flowers from both wild and cultivated sources, we established that this taxon was distinct enough from both *L. mariae* F.Muell. and *L. rigida* Becc. to be recognised at species level. The correct nomenclatural procedure then would normally have been to take Rodd's subspecific epithet '*occidentalis*' and use it as the specific epithet, but the name '*Livistona occidentalis*' has previously been used by Hooker (1884, p. 64) as a synonym for *Brahea dulcis* Mart. and therefore blocks transfer of Rodd's epithet to species rank. The new epithet, '*nasmophila*' was chosen to recognise the palm's habit of occupying permanent watercourses fed by springs through much of its range.

The relationships of *L. nasmophila* are with *L. mariae*, but probably not as close as suggested by Rodd (1998). Petiole armature in *L. nasmophila* is considerably less than that in *L. mariae*. In *L. nasmophila*, the inflorescence bracts are glabrous rather than tomentose, and branching of the partial inflorescences is to five rather than four orders as in *L. mariae*. In *L. nasmophila*, fruit is purple-black rather than black as in *L. mariae*.

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Note

Reduction of *Acacia perangusta* to the synonymy of *A. fimbriata*.

* *Acacia fimbriata* is widespread in eastern Australia from about Rockhampton to near Nowra, New South Wales. It extends inland to the Carnarvon National Park, and there is an early record (before 1925) from Ravenshoe, c. 35 km south of Atherton, which must be considered doubtful. The dimensions of the species' phyllodes and the density of hairs on branchlets and margins of phyllodes vary widely. White (1939) described *A. fimbriata* var. *glabra* and *A. fimbriata* var. *perangusta*, but did not discuss the variability of the species as a whole. Pedley (1980) noted the variability of the species. He placed *A. fimbriata* var. *glabra* in the synonymy of *A. fimbriata* and recognised *A. perangusta*, based on *A. fimbriata* var. *perangusta*. He distinguished it from *A. fimbriata*, as did White, in being glabrous and having long narrow phyllodes with the gland some distance from the base. It was reported as being restricted to the banks of small streams 25 to 35 kms south and south-east of Brisbane and on the Burrum River, a little north of Maryborough. Variation within the species was not discussed, though a specimen intermediate between *A. fimbriata* and *A. perangusta* was noted. Both species are commonly planted in gardens and on roadsides in south-eastern Queensland. The latter is particularly attractive, with pendulous branches and dense shiny bright green foliage. Clearing of native vegetation within the restricted range of *A. perangusta* in the vicinity of Brisbane led to its listing as a vulnerable species. This, in turn, resulted in intensive collecting for identification by consultants for housing developments. Study of such collections indicates that *A. perangusta* should not be maintained as a taxon at any rank as both individuals with narrow phyllodes and broad phyllodes occur in the same population. As in other narrow-phylloded uninerved acacias, the distance of the gland from the base of the phyllode varies with the width of the phyllode: the narrower the phyllode, the greater the distance. The degree of hairiness varies independently of the dimensions of the phyllodes. *A. perangusta* and *A. fimbriata* var. *glabra* are merely extreme forms of *A. fimbriata*. The reduction in rank of *A. perangusta* is formalised below.

Acacia fimbriata A. Cunn. ex G. Don, Gen. Hist. 2: 406 (1832).

Acacia prominens var. *fimbriata* (A. Cunn. ex G. Don) Domin, Biblioth. Bot. 89: 256 (1928); *Racosperma fimbriatum* (A. Cunn. ex G. Don) Pedley, Austrobaileya 2: 348 (1987).**Type:** MORETON DISTRICT: Brisbane River, Sept. 1828, *A. Cunningham* 158 (holo: BM; iso: K)

Acacia prominens var. *whiteana* Domin, *loc. cit.* (1926). **Type:** MORETON DISTRICT: Upper Brisbane River, Aug. 1908, *C.T. White* s.n. (holo: PR)

Acacia fimbriata var. *glabra* C.T. White, Proc. Roy. Soc. Queensland 50: 72 (1939). **Type:** WIDE BAY DISTRICT: near Biggenden, Apr. 1921, *W.R. Petrie* 18A (holo: BRI).

Acacia fimbriata var. *perangusta* C.T. White, *loc. cit.* (1939); *Acacia perangusta* (C.T. White) Pedley, Austrobaileya 1:287 (1980); *Racosperma perangustum* (C.T. White) Pedley, Austrobaileya 2: 353 (1987). **syn. nov. Type:** MORETON DISTRICT: Castra near Brisbane [near Victoria Point], 7 Aug. 1927, *C.T. White* 3554 (holo: BRI)

References

PEDLEY, L. (1980). *Acacia fimbriata*, in A revision of *Acacia* in Queensland. *Austrobaileya* 1: 235-337 ('1979').

WHITE, C.T. (1939). Contributions to the Queensland flora, No. 6. *Proceedings of the Royal Society of Queensland* 50: 66-87.

* *Acacia* is the name used here to be consistent with that used in the Queensland Nature Conservation Act 1992 and the current recommendation before the IAPT to conserve *Acacia* over the correct generic name *Racosperma*.

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Note

Supplement to a synopsis of *Racosperma* C. Mart. (Leguminosae: Mimosoideae).

Despite the care taken in compiling the catalogue of taxa of *Racosperma* (Pedley 2003), errors were made. I have not attempted to correct minor errors, but others are such as to possibly affect the validity of names of some taxa. Minor errors are: deviation from the abbreviations of personal names adopted by Brummitt & Powell (1992) and lapses in the gender of generic names and specific epithets. In one case, the use of a wrong font and indentation could probably cause some confusion. Corrections of major errors are made below. Though the incomplete citation of the authors of basionyms of new combinations probably does not make them invalid, these citations have been completed where necessary.

Racosperma aemulum (Maslin) Pedley
R. aemulum subsp. **muricatum** (Maslin) Pedley *§367b*
Acacia aemula subsp. *muricata* Maslin, Nuytsia 10: 169 (1995).

Racosperma aulacocarpum (A.Cunn. ex Benth.) Pedley, Austrobaileya 2: 345 (1987). *§670*
R. aulacocarpum var. *fruticosum* (C.White) Pedley, Austrobailey 2:345 (1987) **syn. nov.**

Because of the lack of indentation and the font used, the synonymy was not immediately apparent.

Racosperma awestonianum (R.S. Cowan & Maslin) Pedley, comb. nov. *§499*
Acacia awestoniana R.S. Cowan & Maslin, Nuytsia 7: 185 (1990).

Note use of incorrect form of specific epithet.

Racosperma baeuerlenii (Maiden & Blakely) Pedley, Austrobaileya 2: 345 (1987) *§466*
Incorrect citation of authors of basionym.

Racosperma carnosulum (Maslin) Pedley, comb. nov. *§423*
Acacia carnosula Maslin, Nuytsia 12: 331 (1999)

Incorrect basionym.

Racosperma dealbatum (Link) Pedley
R. dealbatum subsp. **subalpinum** (Tindale & Kodela) Pedley, comb. nov. *§52b*
Acacia dealbata subsp. *subalpina* Tindale & Kodela, Telopea 9:319 (2001).

Fictitious basionym.

Racosperma deltoideum (A. Cunn. ex G. Don) Pedley
R. deltoideum subsp. **amplum** (R.S. Cowan & Maslin) Pedley *§617b*
Acacia deltoidea subsp. *ampla* R.S.Cowan & Maslin, Nuytsia 7: 206 (1990)

Racosperma drummondii (Lindl.) Pedley
R. drummondii var. **elegans** (Maslin) Pedley, comb. et stat. nov. *§952d*
Acacia drummondii subsp. *elegans* Maslin, Nuytsia 1: 468 (1975)

R. drummondii var. **majus** (Benth.) Pedley, comb. nov.
Acacia drummondii var. *major* Benth., Fl. Austral. 2: 419 (1864) *§952c*

Ranks of the basionyms of the infraspecific taxa were confused.

Racosperma euthycarpum (J.M. Black) Pedley
R. euthycarpum var. **oblanceolatum** (Stephen H. Wright) Pedley *§sub 81*
Acacia euthycarpa var. *oblanceolata* Stephen H. Wright, Muelleria 16:64 (2002).

Racosperma fauntleroyi (Maiden) Pedley *§ 863*
Acacia fauntleroyi Maiden, J. & Proc. Roy. Soc. New South Wales 53:194 (1920)

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Racosperma gloeotrichum (A.R. Chapm. & Maslin) Pedley, comb. nov. *§708*
Acacia gloeotricha A.R. Chapm. & Maslin, Nuytsia 12: 487 (1999)

Place of publication of basionym omitted.

Racosperma gordonii (Tindale) Pedley, comb. et stat. nov. *§162*
Acacia brunioides subsp. *gordonii* Tindale, Contrib. New South Wales Natl Herb. 4: 74 (1968).

Incorrect basionym.

Racosperma heterochroa (Maslin) Pedley
R. heterochroa subsp. **robertii** (Maslin) Pedley *§259b*
Acacia heterochroa subsp. *robertii* Maslin, Nuytsia 10: 95 (1995).

Racosperma insolitum (E. Prtitzel) Pedley
R. insolitum subsp. **efoliatum** (Maslin) Pedley *§248c*
Acacia insolita subsp. *efoliata* Maslin, Nuytsia 12: 362 (1999).

Racosperma kochii (W.V. Fitzg. ex A.J. Ewart & Jean White) Pedley *§406*
Acacia kochii W.V. Fitzg. ex A.J. Ewart & Jean White, Proc. Roy. Soc. Victoria n. ser. 23: 285 (1911)

An example of author citation at its worst.

Racosperma neurophyllum
R. neurophyllum subsp. **erugatum** (R.S. Cowan Maslin) Pedley *§885b*
Acacia neurophylla subsp. *erugata* R.S. Cowan & Maslin, Nuytsia 10: 51(1995).

Racosperma obtusatum (Sieber ex DC.) Pedley *§115*
Acacia obtusata Sieber ex DC., Prodr. 2:453 (1825).

Racosperma phlebophyllum (F. Muell. ex H.B. Williamson) Pedley *§895*
Acacia phlebophylla F. Muell ex H.B. Williamson, in A.J. Ewart, Fl. Victoria 607 (1931).

Racosperma seclusum (M.W. McDonald) Pedley *§691b*
Acacia seclusa M.W. McDonald, Austral. Syst. Bot. 16: 152. t.9 (2003)

A. tumida var. *pubescens* Maiden, in A.J. Ewart & O.B. Davies, Fl. N. Terr. 344 (1917).

Racosperma stereophyllum (Meisn.) Pedley, *§852*
Acacia stereophylla Meisn., in J.G.C. Lehm., Pl. Preiss. 2: 203 (1848).

Racosperma stipuligerum (F. Muell.) Pedley *§707*
R. stipuligerum subsp. *glabrifolium* (Maiden & Blakely) Pedley, Austrobaileya 2:356 (1987), **syn. nov.**

Racosperma tumidum (F. Muell. ex Benth.) Pedley
R. tumidum var. **kulparn** (M.W. McDonald) Pedley, comb. nov. *§sub 691*
Acacia tumida var. *kulparn* M.W. McDonald, Austral Syst. Bot. 16: 160. t.13 (2003).

Racosperma wickhamii (Benth.) Pedley *§756*

The note following the species should refer to *Acacia wickhamii* subsp. *viscidula* and *A. wickhamii* subsp. *parviphyllodinea* , not to *A. wickhamii* subsp. *viscidulum* and subsp. *parviphyllodineum*.

I am grateful to my colleagues at BRI who pointed out the mistakes.

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Addendum

Map symbols in the following captions on pages 433–436 disappeared during printing

Map 2. Distribution of *Croton* in Australia. ▲ *C. aridus*, ★ *C. arnhemicus*, ● *C. stigmatosus.*

Map 3. Distribution of *Croton* in Australia. ▲ *C. schultzii*, ■ *C. brachypus*,★ *C. multicaulis* subsp. *velutinus*, ● *C. acronychioides*, ▼ *C. choristadenius, C. simulans, & C. stockeri.*

Map 4. Distribution of *Croton* in Australia. ▲ *C. byrnesii*, ■ *C. dockrillii*, ★ *C. rarus*, ● *C. minimus.*

Map 5. Distribution of *Croton* in Australia. ▲ *C. habrophyllus*, ★ *C. capitis-york*, ● *C. densivestitus*, ■ *C. magneticus*, ▼ *C. mamillatus.*

Map 6. Distribution of *Croton* in Australia. ★ *C. insularis*, ● *C. armstrongii.*

Map 7. Distribution of *Croton* in Australia. ● *C. caudatus*, ★ *C. triacros*, ▲ *C. verreauxii*, ▼ *C. waterhouseae.*

Map 8. Distribution of *Croton* in Australia. ▲ *C. multicaulis* subsp. *multicaulis*, ★ *C. phebalioides.*

Map 9. Distribution of *Croton* in Australia. ● *C. tomentellus*, ▲ *C. mutabilis*, ★ *C. capitatus*, ■ *C. setigerus*, ▼ *C. glandulosus.*

Referees consulted for Volume 6

Acceptance of papers has depended on the outcome of review by referees. Apart from a few who did not wish to be listed, those consulted during the past four years are listed below. Several were consulted on more than one occasion. Sincere thanks are extended to all these people whose expertise has helped to maintain journal standards

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